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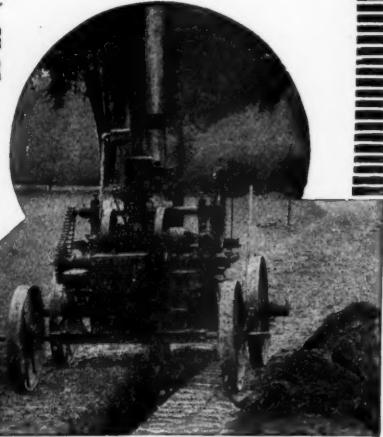
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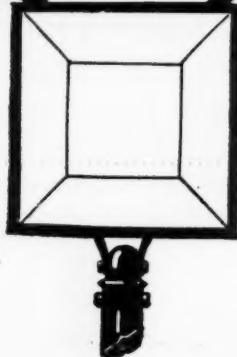
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No. 16

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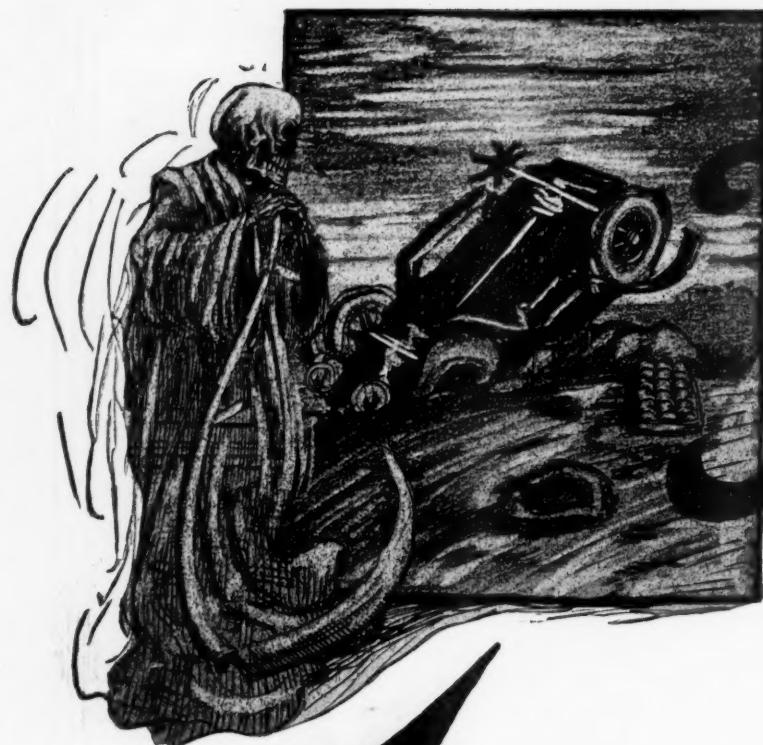
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Los Angeles, Cal.
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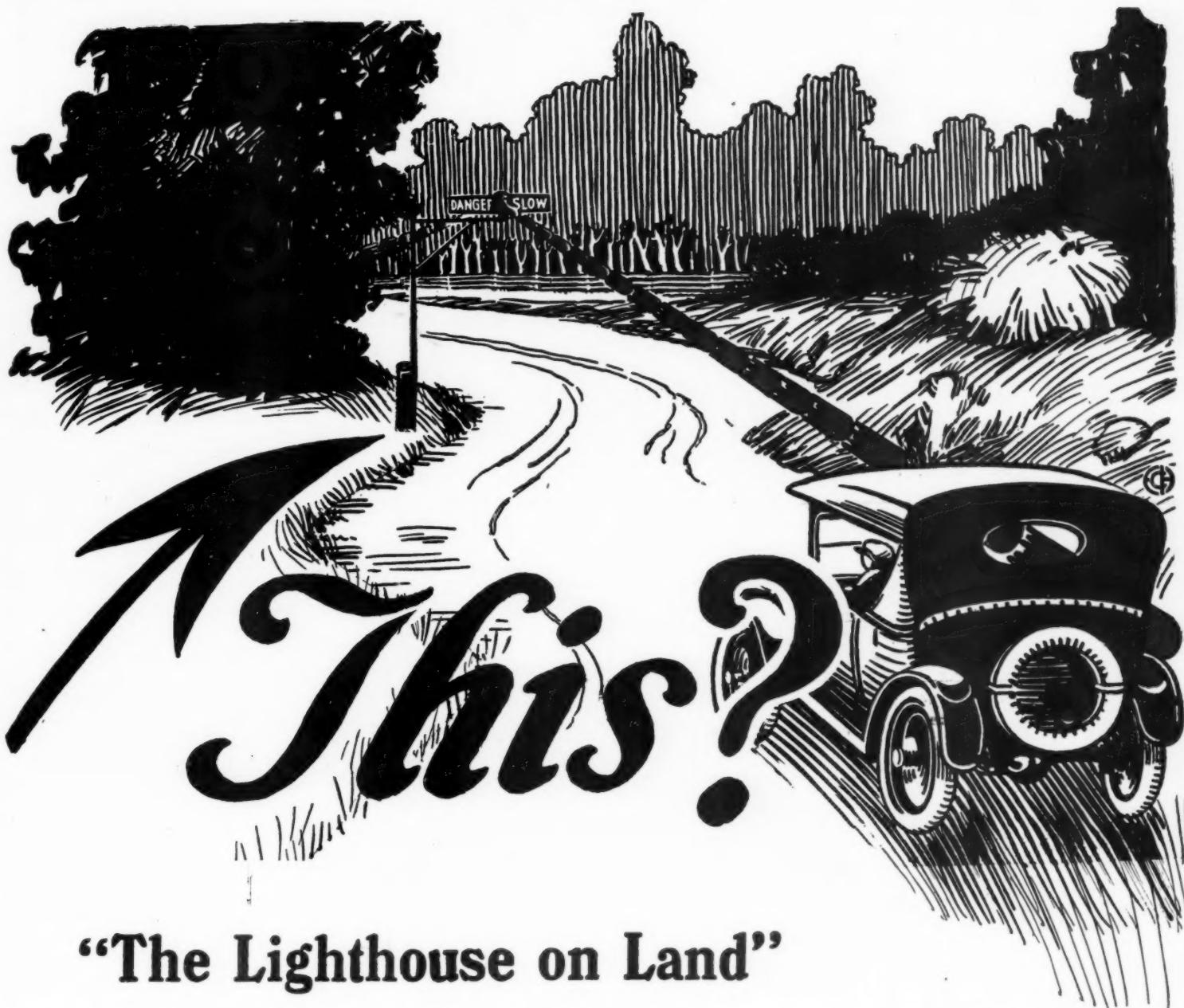


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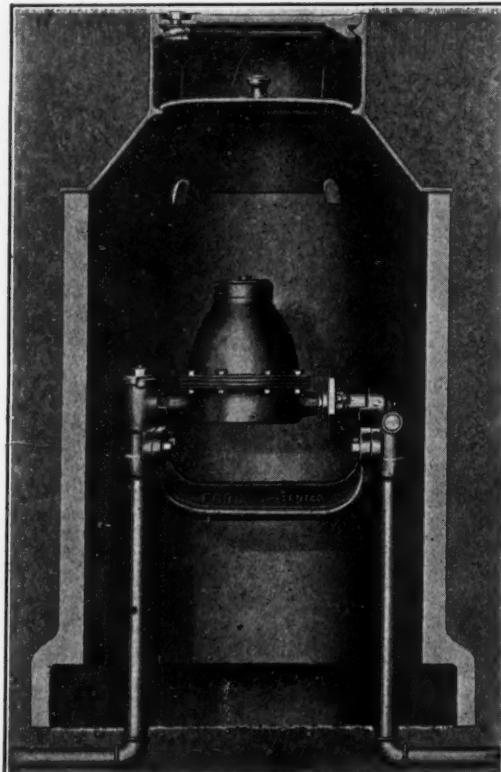
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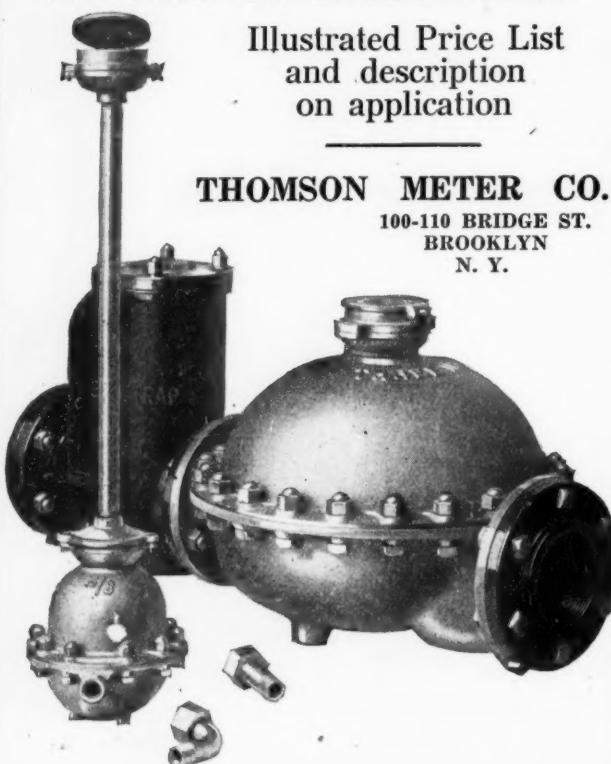
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Municipal Journal

Volume XLV.

NEW YORK, OCTOBER 19, 1918

No. 16

IMPROVING FORT WORTH'S WATER SUPPLY

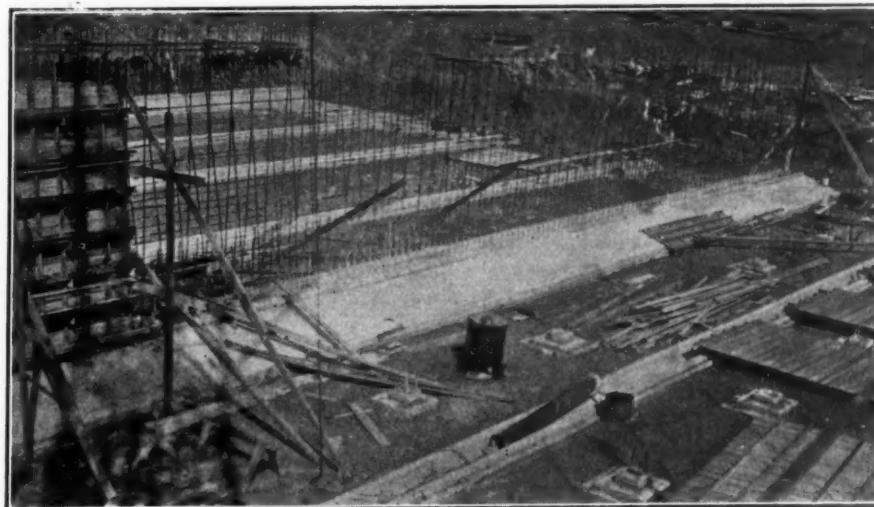
Supplying Camp Bowie Necessitates Increasing Amount of Filtered Water—New Plant Under Construction Comprises Aerators, Sedimentation Basins, Rapid Filters, Wash-Water Basins and Liquid Chlorine Apparatus.

To adequately care for an increased population, due, in part, to the location of Camp Bowie, in the outskirts of the city, and to provide for the demands of the camp which draws its water from the city mains, the city of Fort Worth, Texas, is making such additions to its water treatment plant as will enable it to furnish daily ten million gallons of filtered water. The present filter plant has a capacity of only five million gallons, while the consumption by the 130,000 people now within the city limits and the soldiers stationed at Camp Bowie has reached more than seven million gallons. The additional supply has been drawn from wells of such doubtful character as to require chlorination to make it potable. Moreover, the cost of pumping from the artesian wells has been costly.

The water supply of Fort Worth is drawn chiefly from

filters of the mechanical type, after which it is dosed with liquid chlorine by means of a Wallace & Tiernan solution feed machine. The sediment basins are each 30 feet wide by 5 feet long, affording a travel of about 130 feet and a retention period of 45 minutes when the filters operate at the rate of five million gallons per day. The coagulating chemicals are added by electrically driven dry-feed machines; provision also being made to add alum in solution, in case of emergencies due to the failure of the electrical power.

The present filters were constructed in 1911 by the Pittsburgh Filter Company. There are four units, each 20 by 25 feet. They are of the ordinary strainer type of bottom and are equipped with air and water wash. The capacity of each bed is about 1,250,000 gallons per day. The water as it comes from the filters is dosed with



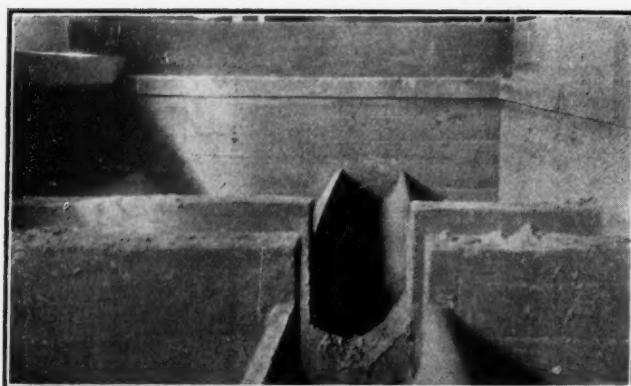
SEDIMENTATION BASINS UNDER CONSTRUCTION.
Dividing wall base and reinforcement in center. Beyond this, drains and baffle wall foundations. In the foreground, drain.

Lake Worth, which was constructed in 1914 by damming the West Fork of Trinity river about ten miles above the city. The drainage area above the dam is approximately 1,800 square miles. The lake is about 15 miles long and varies in width from a quarter of a mile to more than a mile, containing about 6,000 acres. Though there is no control of the water shed above the lake and though bathing is permitted in the lake, under certain restrictions, the quality of the water is good. This is due in a large part to the size of the lake and the consequent length of storage. The water is brought to the city through a concrete conduit about ten miles long which varies in size from 36 to 48 inches.

At present the water is dosed with lime and iron, flows through two small sedimentation basins and through

liquid chlorine and then passes into the clear-water well, which is outside and south of the filter house. This well is 82 feet wide by 114 feet long and has a depth of about 15 feet. With a capacity of slightly over one million gallons, the reserve supply in this basin, when full, is sufficient for approximately five hours.

This filtered water supply is augmented at present by artesian water from two sources. There are five wells sunk along the river near the filter plant. Water from these wells is raised by air-lift into a receiving tank, from which it flows by gravity to a large collecting reservoir at the pumping station. This water, averaging about one and a quarter million gallons daily, is chlorinated, also with a Wallace & Tiernan solution feed machine. The other artesian well supply delivers water to the



WASH-WATER TROUGH IN FILTER.

south side of the city. These wells are about three miles south of the city. The water is of fairly good, sanitary quality, and is not at present being treated. The water is raised by air-lift, the compressor being driven by electric power.

Foreseeing, with the greatly increased number of people depending upon the city for water, that the present system would be severely taxed during the summer of 1918, the city contracted last fall for the construction of a new preliminary treatment plant and for four additional filter units, thus doubling the capacity of the plant. The additional filters will be finished about the first of October,* but the preliminary treatment plant is still far from completion.

THE NEW PLANT.

The new plant will provide for aeration of the water as well as for additional settling basins and filter units. The water, as it reaches the plant from the conduit, will be sent through the aerators, though provision is made for by-passing it in case aeration is not desired. The aerating apparatus consists of 64 aerator nozzles mounted on a grid of pipes, ranging in size from 14 to 8 inches, the nozzles being spaced 2 feet 6 inches apart and mounted on 3-inch galvanized iron risers set into pads cast on the pipe. The design of the nozzles has not yet been settled upon. The aerating basin is 85 feet wide, 110 feet 8 inches long and 3 feet 6 inches deep and is constructed as a cover to the easterly of the two new sedimentation basins.

From the aeration basin the water passes over a weir, along a channelway and through a 30-inch inverted siphon to the mixing chamber, where the lime and iron are added. Four dry-feed chemical machines are installed, one pair being held in reserve in case of accident to the other pair.

Following the addition of the coagulating chemicals, the water passes into a mixing chamber 126 feet 6 inches long and 46 feet wide, which is divided by baffle walls into twenty-six chambers, thus giving a winding channel 5 feet wide, 3 feet 3 inches deep and about 1,200 feet long. Gates are provided so that the length of travel of the water can be regulated by turning it into the settling basins at the end of any one of the 26 chambers. Adjoining the mixing chamber is the chemical house approximately 46 feet square and provided with a hydraulic hoist and ample storage room for chemicals.

Two sedimentation basins are provided, so arranged

that both may be used at once or one may be cut out for cleaning or other purposes. Both basins are of the same size—85 feet wide, 130 feet long and 15½ feet deep. A central wall divides each basin so that a flow of at least 200 feet is required of the water in passing from the entrance to the exit weir. Along the center line of each half-basin is constructed an 18-inch open drain, having a semi-circular invert and vertical sides. To facilitate cleaning, the floors of the basins are sloped toward the drain, the fall being 6 inches in 21 feet.

As stated before, the east basin is covered, the top being used as the bottom of the aerating basin. This top, which is of reinforced concrete, is supported by reinforced concrete columns varying from 14 to 18 inches square, spaced 15 feet 3 inches center to center. The columns are supported on reinforced concrete footings, which vary in size with the load on them, but average 25 square feet of bearing surface. Both sedimentation basins are paved with two 4-inch layers of concrete, placed in blocks about 8 feet square, the joints in the upper layer offsetting those below by at least 4 inches.

The east side walls of the covered basin are 12 inches thick at the top and 20 inches at the bottom, this rather slender section being possible because of the support of the roof beams and the earth backing. The footing for this wall is 10 feet wide, 5½ feet of which extends back



END OF PARTITION WALL FOOTING.
Showing reinforcement. Drains at right and left of footing.

under the earth backfill. On the inside edge of the footing, four-inch notches are provided for a close connection with the floor pavement. The center wall is designed to withstand all stresses that may occur when both basins are full or both or either empty, with the aeration basin either full or empty. This wall has a top thickness of 12 inches and is 30 inches thick at the bottom. The footing on this wall is 14 feet wide and extends 4½ feet below the pavement level. All walls and columns are reinforced.

From the sedimentation basins, the water will flow to the old filter house. On the way, it can be passed through the old sedimentation basins and, if it should be necessary to add more coagulant before filtering, this can be done here. A flow of 7,500,000 gallons per 24 hours will allow for a detention period of 6 hours if both basins are operated.

The additional filter units, four in number, will be constructed in an extension to the present filter building, two on each side of the present operating floor. When completed, there will be four units on each side of the pipe gallery.

Each new unit has a filtering surface 20 by 25 feet in

*This was written about September 20th.

plan. The strainer system consists of a main collecting pipe extending from the front of the filter to the rear, into which are screwed at right angles 2-inch pipes spaced about six inches apart. On the under sides these pipes are perforated with two rows of strainer holes, $9/32$ inch in diameter, 6 inches apart and 30 degrees off center. No other strainer system is provided, these holes being used both to collect the filtered water and also to distribute the wash water when the filters are being cleaned. There will be no air used in washing the new filters. They are designed for a rate of rise of wash water of approximately 20 inches per minute.

Around and over the collecting pipes is placed 18 inches of graded gravel ranging in size from 2 inches at the bottom to $\frac{1}{8}$ inch at the top. On this is placed 27 inches of sand.

The collecting troughs, eight in number over each bed, discharge into a central channel. They are of concrete, cast in place, with the lip 20 inches above the surface of the sand. They are constructed with a V-shaped bottom, about 12 inches deep, and with vertical extensions which vary in height from about 4 inches at the upper end to 9 inches at the outlet end.

The new filters are to be equipped with rate controllers of the Venturi type, made by the Builders Iron Foundry, and with loss-of-head and automatic rate gages. All of the necessary valves will be hydraulically operated from a single stand opposite each filter. When the new filters are placed in operation, the controlling devices on the old units (which are now disconnected because of the necessity of filtering all the water possible regardless of rates) will be overhauled and placed in operation, so that uniform and standard rates of filtration will be obtained.

The combined effluent from all the filters will be disinfected with liquid chlorine on its way to the clear well. Plans for improvements do not contemplate any enlargement of the clear well at present. The reserve capacity in the basin when full is equal to about 10 per cent of the daily output of the filter plant or about $2\frac{1}{2}$ hours supply.

An unusual feature in the new plant is the retention basins provided for the wash water from the filters during high stages of the Clear Fork of the Trinity river, on the banks of which the plant is situated. The outlet of the wash-water line from the filters is at such an elevation that during high stages of the river there is no head available for a gravity flow. During high water periods the wash water will flow into these two detention tanks and be pumped from there to the river by electrically driven centrifugal pumps. One basin is placed at the end of each line of filters. The basins are

about 15 feet deep and are 23 feet 4 inches long by 14 feet 6 inches wide.

The water system of the city and the construction work on the new plant is under the general charge of J. C. Lord, water commissioner. F. J. Von Zubon, city engineer, is supervising the construction work. The contractors on the filter plant are Newcombe & Bell of Dallas, Tex., and on the preliminary treatment plant, Westinghouse, Church, Kerr & Co., New York City. The Pittsburgh Filter Company is supplying the filters, which are being installed under the direction of L. C. Roberts, engineer for the company. O. P. Strawn is superintending the work for Westinghouse, Church, Kerr & Co.

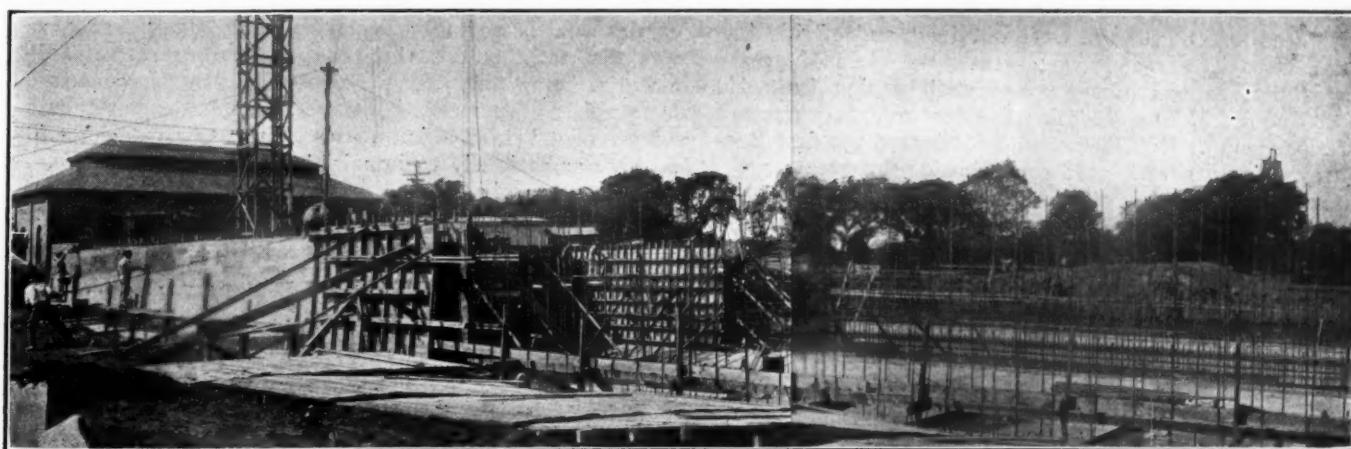
MILES ACID TREATMENT OF SEWAGE

Continuation of Report on Experiments at New Haven by C. E. A. Winslow and F. W. Mohlman —Amount, Character and Value of Products Obtained.

According to these results, but 40 per cent of the suspended solids were removed from the sewage, as compared with 60 per cent by the Miles acid process. Septic conditions were pronounced in the tank, as the increase in ammonia nitrogen and alkalinity indicate. Bacterial determinations were not made during this test, but there is no reason to suppose that the count decreased to an appreciable extent, particularly in view of the offensive condition of the sludge.

The sludge was higher in moisture content than was the Miles sludge, and there was much less sludge and grease recovered. This was partly due to the low suspended solids in the raw sewage, but even if there had been 105 parts, as in the acid tests, instead of 88, the sludge and grease recovered would have been, respectively, 360 and 70 pounds. These quantities are 75 per cent and 58 per cent of the quantities recovered by the acid process.

Table IV shows in summary form the average results obtained from the treatment of the East street sewage by the various processes studied by us. It will be noted that with the particular sewage in question, which is so difficult to treat by biological methods, the Miles process gave a better purification as measured by removal of total suspended solids, volatile suspended solids and settleable solids than any other method of treatment. Only from the standpoint of turbidity and ammonia N did even the activated sludge process yield a superior effluent, and the superiority in this case was but slight.



GENERAL VIEW OF PRELIMINARY AND SEDIMENTATION BASINS. CHEMICAL HOUSE AT THE LEFT.

Table IV. Comparative Results of Various Processes Studied.

Ammo- nia N.	Turbid- ity.	Suspended Solids.		
		Total.	Vola- tile.	Settle- able.
Wire mesh screens..	—	15	—	41
Plain sedimentation	30	23	41	34
Imhoff tank	12	14	43	38
Activated sludge	13	44	55	50
Miles acid process..	0	36	61	54
DEOXIDIZING INFLUENCE OF THE MILES ACID EFFLUENT.				

An interesting possible complication was brought out in the New Haven experiments by observation of the fact that the effluent from the acid treatment contains so much sulphurous acid and bisulphite that it will take up a very large amount of oxygen from the water into which it is discharged. For example, when a sample of effluent containing 118 parts per million of SO_2 was mixed with sea water containing 12 parts of oxygen it caused an almost instantaneous reduction of the oxygen content to 1 part in a mixture containing one third effluent, to 5 parts in a mixture containing one-fifth effluent; to 8.8 parts in a mixture containing one-tenth effluent, and to 11 parts in a mixture containing only one twentieth effluent.

If this occurred with the small amounts of acid needed for our weakly alkaline sewage, the phenomenon would be still more marked with ordinary sewages; and although putrefactive changes are not immediately to be feared, the destruction of higher plant and animal life in the waters near an outfall might create serious problems. The effect of the acid upon tanks and other structural elements of the plant also deserves serious consideration.

It might in certain cases be best to make special arrangements for reaerating the effluent before discharge, if destruction of fish life as a result of deoxidation were deemed a serious danger. It has been shown by one of us (Mohlman, 1918) that this can be easily accomplished by aerating through filtrate plates with relatively small volumes of air. When a small experimental tank was operated on a continuous flow plan with 97,000 cubic feet of free air per million gallons of effluent for a period of 30 minutes, 70 per cent of the sulphur dioxide was removed, yielding an effluent that did not de-aerate diluting water to any appreciable extent.

AMOUNT AND CHARACTER OF GREASE RECOVERED.

Such minor difficulties as those just mentioned can no doubt be overcome if the acid treatment should prove in general efficient and economical. That it is efficient seems reasonably clear; but its economic practicability depends on the value of the grease to be recovered from the sludge. In the Boston experiments reported by Weston (1916) 1800 to 1900 pounds of dry sludge per million gallons of sewage were obtained, and of this material 22 to 23 per cent was grease, the yield of grease per million gallons of sewage treated varying from 430 to 436 pounds. The sludge had a low moisture content (85.5 per cent). E. S. Dorr, who conducted the first Boston experiments, estimated the value of the grease present at \$15.08 and the value of the fertilizer base at \$9.25

per million gallons of sewage treated. With an estimated cost of \$18 per million gallons for treatment, this would yield a net profit of \$4 per million gallons. Prof. R. S. Weston believes that this estimated margin of profit is too high, but "is unable, by any reasonable comparison with analogous cost data from other sources, including his experience, to wipe it out."

The information obtained in our New Haven experiments in regard to the amount and general character of the Miles acid sludge are presented in Table V.

In comparing these results with those of the Boston experiments, it will be noted that the yield of sludge was less than one-fourth of that recorded at Boston, but this was to be expected since the New Haven sewage is a weak one and the amount of acid needed for precipitation was correspondingly reduced (at least with the East street sewage). The moisture content of the New Haven sludge was not quite so low as that obtained in Boston, but showed an even higher grease content, exceeding 30 per cent of the dry material in two of the tests.

So far the results of the New Haven experiments were very favorable to the Miles process; but when the grease which had been recovered was studied with more care in order to determine its real commercial value the aspect of the matter began to change. The difficulty lies primarily in the presence of a large proportion of unsaponifiable material (waxes, mineral oils and similar substances) in the ether extract, substances of this kind being practically worthless and their presence necessitating costly processes of purification. The sludge obtained in the third 44-day run when analyzed by Dr. Raymond Wells yielded 24 per cent of grease, 46 per cent of tankage and 28 per cent of water. The grease analyzed as follows:

Moisture and volatile matter.....	11.0
Unsaponifiable material	21.1
Free fatty acids (by weight).....	40.2
Neutral grease	22.3
Insoluble and metallic soap.....	3.3

Of the 40.2 per cent of free fatty acids, 14.4 per cent was rosin and 25.8 per cent actual free fatty acids.

The degreased sludge contained 3.91 per cent of nitrogen as NH_3 , 0.96 per cent of phosphoric acid as P_2O_5 , and 51.88 per cent of ash.

The grease obtained from the other three runs made with the East street sewage contained respectively, 19.8 per cent, 20.7 per cent, and 28.3 per cent of unsaponifiable material.

In view of the fact that the East street sewer receives contributions of mineral oil from a munition factory it was thought that the large amount of unsaponifiable material might be due to this cause and the Boulevard plant was installed to test this point in a sewer which carries a fairly normal domestic sewage. The result here was distinctly better, the proportion of unsaponifiable material being only 15.7 per cent with 41.5 per cent free fatty acids, 0.5 per cent moisture and volatile matter and 1.3 per cent insoluble impurities. Even this value is still so high as seriously to impair the value of the grease.

It seems probable that a fairly high content of un-

Table V. Character of Miles Acid Sludge at New Haven.

	25 days	24 days	44 days	70 days	29 days	Boulevard Sewer
Length of run.....	25 days	24 days	44 days	70 days	29 days	
Total gallons sewage treated.....	260,000	239,400	407,820	602,220	145,500	
Gallons wet sludge per m.g. sewage.....	3,750	4,025	3,200	2,600	5,375	
Specific gravity	1.067	1,048	1.054	1.061	...	
Per cent moisture.....	86.6	88	86.3	85.7	92.5	
Pounds dry sludge per m.g. sewage.....	503	483	439	368	403	
Ether extract, per cent dry sludge.....	23.7	24.0	29	32.6	30.9	
Ether extract, pounds per m.g.	119	116	127	120	124	
Volatile matter, per cent dry sludge.....	47.2	51.2	57.3	63.8	78.5	
Nitrogen, per cent dry sludge.....	1.6	1.6	2.4	2.0	3.0	

saponifiable material is a normal characteristic of grease obtained from sewage sludge. Thorpe in his "Dictionary of Chemistry" says "sewage fats are characterized by large proportions of free fatty acids. The amount of unsaponifiable matter is also considerable. The nature of this has not yet been investigated. Probably it consists to a large extent of coprosterol which forms an important constituent of excrementitious matter." Lewkowitsch in "The Technology and Analysis of Oils, Fats and Waxes" notes the presence of 11.6 per cent of unsaponifiable material in the grease obtained at Cassel. The source of this material is apparently the feces themselves, for a review of the literature shows that of the ether extract of dried feces (which amounts to 27 to 35 per cent) 12 to 14 per cent is unsaponifiable matter, about half of the latter perhaps being cholesterol.

VALUE OF PRODUCTS OBTAINED FROM THE MILES ACID PROCESS.

The usual limit for unsaponifiable matter in grease to be used for soap making is about 5 per cent, and unless grease containing 10 to 20 per cent of material of this kind could be economically distilled it could be used only as wool grease, which is worth about half as much as garbage grease, or 5 to 6 cents a pound according to the high prices of 1918*. Samples of the sludge obtained from New Haven sewage were submitted to Colgate & Company and the Cobwell Corporation of New York and to Swift & Company and Armour & Company of Chicago, and the chemists of all of these concerns, after extracting the grease and studying it, were of the opinion that in its crude state the material was of practically no value to the soapmaker. If such grease is to be utilized it must first be freed from its impurities by distillation.

Through the courtesy of C. E. Eaton of William M. Ware & Company of Boston we were put in contact with a firm of grease distillers, the Falk Company of Pittsburgh. P. F. Wild, vice-president of the Falk Company, arranged to distill a 4-pound sample of the grease obtained from the Boulevard sewage. The material was saponified and then decomposed and the fatty acids obtained were distilled. The product which resulted was light brown in color but had a noticeable odor, although the chemist of the Falk Company reported that it was much less offensive than garbage grease. He added that the grease "can be worked in practical manner if the sulphurous fumes which are in combination with the oil can be removed. Otherwise, during distillation this considerable sulphurous acid involved is more or less destructive to the apparatus used, and imparts a rather disagreeable odor during the distillation."

The distilled grease thus obtained amounted to 70 per cent of the crude grease, which yielded in addition 3 per cent of glycerine and 22 per cent of pitch.

According to the estimate of William M. Ware & Company the crude product as obtained from the sewage should be worth 8.5 cents a pound, and the grease from the East street sewage (containing 25 instead of 15 per cent of non-saponifiable matter) not over 6.5 cents. The ether extracts obtained from both sewages varied, as determined in the laboratory (see Table III) between 116 and 124 pounds per million gallons, but the extractions made for us by the Cobwell Company and the Colgate Company indicate that no more than 100 pounds could be safely assumed on a commercial scale in either case. On this basis the Boulevard grease would be worth perhaps \$8.50 per million gallons. The grease-free tankage corresponding to 100 pounds of grease per mil-

lion gallons would amount to 300 pounds for the Boulevard sewage. This grease-free tankage contained 4.8 per cent of ammonia, worth, at \$4.00 a unit (20 cents a pound), \$2.88 per million gallons. The Boulevard sewage would therefore yield products worth altogether \$11.38 per million gallons.

Our data in regard to the grease obtained from the East street sewage is less satisfactory, since this material was not distilled on a commercial scale. Dr. W. S. Richardson of Swift & Company, and Dr. Paul Rudnick of Armour & Company believed the crude product to be practically unsalable. Dr. M. H. Ittner of Colgate & Company found 20 per cent of unsaponifiable material in his sample and emphasized the fact that the grease would have to be distilled and would probably yield less than 60 per cent of fatty acids. G. A. Molleson of Kuh & Valk, grease brokers of New York City, considered the grease as submitted to him to be unsalable and suggested that if the total of moisture, volatile matter and unsaponifiable matter could be brought below 20 per cent it might be worth 5 to 6 cents. Dr. Raymond Wells of the Cobwell Corporation thought that even for use as wool grease, distillation would be necessary and that some of the mineral oils present in this sample might possibly go over in the distillate, making even the distilled product unsuitable for soapmaking. He thought 5 to 6 cents a pound would be as much as the grease was worth. He noted also that the composition of the sludge was such as to promise certain difficulties in extraction if the process were not carefully controlled. Dr. Rudnick had the same experience, reporting clogging and difficulty in the separation of the finely divided sludge from the gasoline extract. He also noted that the dried tankage obtained was objectionably fluffy.

Altogether, in view of the peculiarly unfavorable characteristics of this particular sludge, we do not believe it would be safe to assume a value for the crude product of more than 5 cents per pound. This estimate, however, we feel is not too high in view of the possibility of distilling the grease and its suitability for wool grease if not for soapmaking. This would amount to a return of \$5.00 per million gallons.

The East street sewage should yield 350 pounds of tankage per million gallons but its tankage contains only 3 per cent of ammonia, giving a tankage value of \$2.09 per million gallons, which with a grease value of \$5.00 would give a total return of \$7.09.

(To be concluded.)

PASADENA'S MUNICIPAL PRINTING DEPARTMENT.

In 1914 the city of Pasadena, Cal., purchased a large size multigraph machine using metal type and having as part of the outfit a type-carrier on which the composition was done, which was used as an adjunct to the city's general clerical work. The success of using this by one of the departments was so manifest and the demand for general city printing became so great that it was found necessary to employ some one especially to look after the work. A high school student, Julian Randolph, handled the work on part time until he graduated, since when he has devoted all his time to the management of it. The city employs in the printing department high school students who have become proficient in their school printing course, which policy has proved beneficial to both the city and the students.

In 1916 a flat-bed press was purchased, with other equipment, and now the municipal shop does practically all the city printing, such work as linotyping, ruling and binding, however being done outside. "Besides the con-

*All prices and costs used below are based upon present conditions, and will need to be modified considerably when conditions change, when it is probable that the price received for grease will decrease by a larger percentage than the cost items.

venience and satisfaction which has come from the operation of the municipal printing department, it has much more than repaid all money invested and has in addition effected a considerable saving to the city," says A. L. Hamilton, commissioner of public finance. A considerable part of the saving has been effected by saving and storing type forms that are used more than once, including linotype of annual reports, ordinance books, etc. By keeping a record of the printed forms and the dates on which they are generally ordered, it has been possible to purchase paper for them in advance when the prices are low, and to purchase in large quantities. The department saves all the old office forms, ballots, etc., much of which can be re-used for printing purposes, while that which cannot be so used is made into note pads.

During the year 1917-1918 the work done cost \$6,625, and would have cost, at printers' prices, \$8,447. The cost includes \$2,475 for labor, \$3,756 for materials and miscellaneous charges, and \$384 for administration. No allowance is made for interest or depreciation, but the equipment has cost \$3,580, while the estimated saving to the city has been \$3,916.

WATER WORKS OPERATION

Continuation of Discussion on Boiler Room Economy —Methods of Firing—Quality of Feed Water— Records of Operation.

FIRING.

There are two general methods advocated for hand firing—coking and spreading. In the first, the green coal is piled usually on the front of the fuel bed, the rear of the bed being left white hot; the idea being that heat from the bed under the green coal will distil the volatile gases and that these and the air will be raised to the combustion point in passing over the uncovered portion of the bed. After ten or fifteen minutes, during which the coal has become well coked (deprived of its volatile gases), this pile is broken up and spread over the back part of the fuel bed and a fresh charge is piled at front. (This method applies to bituminous and not to anthracite coals). This method is satisfactory in securing smokeless combustion but is believed not to secure maximum efficiency. The keynote of efficiency is believed to lie in maintaining a uniform fuel bed, and this the coking method of firing does not do.

The spreading method consists of applying small quantities of coal in a thin layer at frequent intervals. This requires more frequent firing and more attention on the part of firemen, but is believed to secure the best results. Holes should not be permitted to develop, but when a thin place is noticed in the fire bed (such place will appear brighter and hotter than the rest of the bed), such thin place should be covered immediately with a small amount of coal.

In firing bituminous coals, it is necessary that some auxiliary air be taken in over the fuel bed for a few minutes immediately after firing. This should enter close to the surface of the fuel bed, preferably from the front through auxiliary dampers in the fire door. Automatic devices can be used which open small supplementary dampers when the fire door is opened and close them very gradually after the door is shut, the closing usually occupying about three minutes. Some find the use of a steam jet immediately after firing to be advantageous in that it not only carries in the oxygen required for combustion but also thoroughly mixes it with the gases.

Mechanical stokers accomplish one prime requisite

for good combustion—they insure a uniform supply of coal and air. They require as intelligent attention as does hand firing and should be inspected regularly to see that all ledge plates, baffles and other devices designed to decrease air leakage are performing their functions properly. The rate of feed should be so adjusted as to keep the grate uniformly covered with fuel and minimize the amount of unburned coal carried over into the ash-pit.

FEED WATER.

Most waters used for boilers contain more or less of some impurity that forms deposits in the boiler. These deposits tend to decrease the evaporating capacity of the boiler, and if they are not removed will in many cases cause overheating of tubes and sheets. To prevent these objectionable results, the impurities in the feed water should be removed before it enters the boiler.

The impurities most often found in feed water can be divided into three classes: (1) those which produce incrustation and the formation of sludge, these comprising sediment, mud, etc., bicarbonates and sulphates of lime and magnesia; (2) those that cause corrosion, comprising chloride and sulphate of magnesia, acid, dissolved carbonic acid and oxygen, grease, and organic matter; (3) those that cause priming (carrying over particles of water with the steam as it leaves the boiler), comprising sewage, large quantities of salts that are readily soluble, and carbonate of soda in large quantities. The last named may also cause brittleness in the boiler plates.

For removing sediment, sedimentation tanks or filtration is generally the best remedy. For removing the bicarbonates and sulphates of lime and magnesia, the standard methods of softening water by adding lime, soda, "Permutit," etc., are in common use and are effective when intelligently employed. Part of the hardness may also be removed by heating the feed water, thus causing the materials to be deposited before the water enters the boiler. Grease and organic matter may be removed by filtration, coagulants, etc.; acids can be neutralized with carbonate of soda, and the magnesia can be removed by softening remedies as above. Sewage can be removed by settling tanks or filtration, while the salts named may require chemical treatment for removing or neutralizing them.

Undoubtedly the safest plan is to submit a sample of the water to a reliable chemist for analysis and prescription. So-called boiler compounds no doubt give satisfactory results in many cases in the prevention of new scale but not in the removal of old scale. In general, no compound should be used except on the advice of a reliable chemist. In no event should the use of boiler compounds be regarded as a satisfactory substitute for regular cleaning and inspection.

With certain kinds of feed-water-heaters a considerable portion of the scale-forming ingredients are precipitated before the water enters the boiler. This is an additional argument for the use of feed water heaters, other advantages of which are that steam boilers are more or less seriously affected by unequal contraction when cold water is fed into a hot boiler, and the tubes of water-tube boilers and the seams of return-tubular boilers are likely to develop leaks where this is practised. Also the pre-heating of the feed water increases the steaming capacity of the boiler.

RECORDS OF OPERATION.

The chief object of a boiler plant record is to enable the superintendent to determine with reasonable reliability the cost of operation, relative efficiency of the plant and the improvement from time to time. For practical

purposes the index of the performance of any steam generating plant lies in the relation between (1) the number of pounds of water evaporated and (2) the number of pounds of coal fired, less the weight of the ash. In addition, the records should contain such data as may be required for detecting and remedying any defects in operation which may be responsible for loss of efficiency.

No satisfactory record of operation is possible unless the plant is equipped with the following:

— Means of weighing the coal for each boiler.

— Means of weighing the ash removed from the pit of each boiler.

Some device for weighing or measuring the water fed to each boiler or the steam delivered by it.

A thermometer for indicating the temperature of the feed water.

A draft gauge connected into the space above the fuel bed and into the ash-pit.

A differential draft gauge connected into the space above the fuel bed and into the flue gas passage near the point of discharge from the boiler.

A CO₂ analyzer.

A pressure gauge at the boiler; also at the ends of all live steam lines.

A pyrometer for indicating the temperature of the flue gases leaving the setting.

Some of these devices are already part of the equipment of most plants and the others may be secured at so slight a cost in proportion to the saving to be effected that there can be no excuse for not installing them. The first four of the appliances named are for determining the pounds of water evaporated and the pounds of ash-free coal fired; while the last five items are needed to indicate the source of any defects in operation or trouble which may occasion losses.

A suggested form for keeping a daily record of the boiler plant is given herewith. Items one, two and three should cover the entire shift of the firemen for each boiler. Items four to nine inclusive should contain readings taken for each boiler at hourly or other regular intervals throughout the shift.

SEWAGE DISPOSAL ON THE DETROIT RIVER

Report on Relief of Pollution of River by Several Canadian Towns—Interceptor and Clarification by Tank Treatment.

A group of municipalities on the Canadian side of the Detroit river opposite Detroit have been confronted with a difficulty connected with the disposing of their sewage into that river, since it is one of the boundary waters between the United States and Canada and will therefore be affected by any rulings as to the pollution of such waters which may result from the report of the International Joint Commission. A study of the problems of these municipalities was carried out by Morris Knowles and John M. Rice, of Pittsburgh, under the jurisdiction of the Essex Border Utilities Commission. A report was made to the commission in 1917, and this report formed the basis of a paper prepared by Messrs. Knowles and Rice for the American Society for Municipal Improvements. This paper briefly outlined the methods adopted and proposed by nineteen cities in Europe and America for eliminating the nuisance caused by the deposit of raw sewage into rivers and harbors; also it gave a description of the various methods available for preventing such nuisances, these including flushing, screening, sedimentation, precipitation, septicization, sludge disposal, land filtration, sand filtration, contact filtration, trickling filtration, activated sludge method, and disinfection.

Following this general description, the authors concluded that "the best method of abating the nuisances due to flotation, deposition, putrefaction and infection from the sewage of the Essex Border municipalities is the collection of the sewage in an interceptor and its delivery to one or more centrally located points where additional treatment may be applied under proper supervision. The works to accomplish this result are planned to consist ultimately of interceptors, two-story settling

FORM FOR KEEPING DAILY RECORD OF A BOILER PLANT.

Date.....	1st shift M to M.
Boiler No.....	Name of Fireman.....
1. No. lb. Coal Fired	2nd shift M to M.
2. No. lb. Ash Removed	Name of Fireman.....
3. No. lb. Water Evaporated	3rd shift M to M.
4. Temp. of Feed Water	Name of Fireman.....
5. Boiler Pressure	
6. Draft Gage Readings	
7. Differential Gage Readings	
8. CO ₂ Readings	
9. Temperature of Flue Gases	

tanks, disinfection plants, detention basins and multiple deep dispersion outlets. Designs should be worked out for this ultimate development, and all new sewerage construction made to conform to these designs; and all of the proposed works, excepting the settling tanks, should be built as soon as the financial condition of the community will permit. The construction of the sedimentation works, however, should be deferred until the general policy for the control of the river as a whole has been formulated, at which time much more information will no doubt be available regarding the process of activated sludge, and regarding the comparative advantages and economy of this process, fine screening, and two-story tank treatment."

The report was accepted by the commission and the people voted to construct the first portion of the intercepting sewer and contracts have been let recently for the east interceptor, which serves the municipalities of Ford City, Walkerville and part of Windsor.

The sewage will flow by gravity through Ford City and **Walkerville to a pumping station**, where it will be lifted to an interceptor at a higher level. Walkerville and Windsor are well sewered on the combined plan, but it was assumed that Ford City, which had no sewerage system, would adopt the separate system; and the interceptor was planned to meet these conditions. A part of the storm water is to be taken from the Walkerville and Windsor sewers so as to take care of the first street washing and reduce the pollution of the river-front water. Regulating chambers are provided at points where the outlet sewers cross the interceptor, these chambers diverting into the interceptor, the dry weather flow plus the storm water allowance. Measuring chambers are provided for at the dividing lines between the several municipalities to determine the actual sewage flow from each.

In estimating the amount of sewage flow, the factors taken into consideration were the domestic, industrial and public water consumption, ground water leakage, storm water allowance, and economic considerations. A ratio of about 2.5 between maximum and average flow was used for small sewers, which ratio was decreased gradually to about 1.75 for the interceptors. It was concluded that 90 per cent of the domestic water consumption, 85 per cent of the industrial use, and 50 per cent of the public use would be returned as sewage flow.

Ground water infiltration through joints was taken as 15,000 imperial gallons per day per mile of pipe in clay soil and 25,000 in sandy soil, which, on a basis of 1.25 miles of sewer per thousand population, gives 31 gallons per capita per day, equivalent to .005 inch of rainfall runoff per hour. The ratio of depth of flow to diameter of sewer was taken as not over 0.50 for all sizes up to twenty-four-inch and not over 0.80 for twenty-four-inch and over. The minimum velocity for maximum flow was taken as 2 feet per second in the Ford City section and 2.5 feet per second in the Walkerville and Windsor sections.

The general experience with mechanically operated regulators seems to be that they are satisfactory except for their constant need of inspection and the formation of deposits around the float chamber. The authors studied different types of apparatus and finally adopted a regulator consisting of a float in a float chamber directly connected to the intercepted sewer, two perpendicular and one horizontal bars forming the connection between the float and a gate in a gate chamber at the end of an opening designed to take the dry weather flow plus storm water allowances. The float, being actuated by the elevation of sewage in the sewer, opens and closes the gate to discharge the desired quantity through the gate area.

A screen is provided between the float chamber and the sewer to avoid deposits in the chamber. A three-inch pipe drain with a valve at the lower end connects the float chamber to the gate chamber to permit draining of the former. A stop plank at the gate entrance and a by-pass outlet are provided in case the apparatus has to be cleaned, removed or repaired. A dam of sufficient height at the lower end of the intercepted sewer in the chamber diverts the dry-weather flow into the regulating chamber.

A system by which sewage flow could be measured accurately was necessary, not only to apportion properly the annual charges to the several municipalities, but also to fix the responsibility in case of overcharge of sewers and consequent need of extensions. It was decided to measure the sewage only where the interceptor crosses the municipal boundaries and not where each sewer connects with the interceptor. A small number of meters was advantageous because they would require constant attention, and the reduction in number would allow the use of more expensive and accurate apparatus.

From the standpoint of accuracy and economical operation, Venturi meters were considered to be most satisfactory. Also they eliminate most of the objection of loss of head which, in the case of weirs, would be rather serious since each drop at a weir would entail deepening the entire length of sewer below the weir. The Ford City measuring chamber contains a 20-inch by 6-inch meter, the chamber being arranged so that this can be changed to a 20-inch by 10-inch meter. The sewage flows through a cleaning chamber before it enters the Venturi tube. This tube is located in a circular brick chamber, above which are a register chamber and manhole. After the sewage flows through the meter it passes through a cleaning chamber and manhole to the interceptor. A by-pass is located along the meter chamber to divert the flow directly into the lower cleaning chamber, stop planks being provided at both ends of the by-pass.

Bids for this work were received on August 22, 1918, on the following basis: The commission agreed to pay the amount estimated by the lowest reliable bidder on a unit price bid plus a fee of \$12,000, which will be increased by 25 per cent of the saving over the estimated cost and decreased by 10 per cent of any amount that the work costs more than agreed estimate. The contract was awarded on an estimated cost by the low bidder of \$108,600, not including the fee. The lowest bid received a short time previous on the ordinary unit price basis had been \$163,600. The cost estimated in December, 1916, was \$95,200.

PROGRAMS FOR STREET WORK FOR 1919.

As stated in our issue of August 31, the United States Highway Council has required, as a condition to the receiving of a license or permit for highway improvement next year, that each city or other political unit prepare and submit to the council a program of such work. In a recent circular by the council it is stated that these programs are to be submitted to the council on or before December 10, 1918.

In response to queries from local officials, the Highways Council recently made the following rulings:

The council does not exercise jurisdiction over sidewalk construction.

Construction work, whether it costs more or less than \$2,500, should be submitted if it involves any of the materials under the control of the War Industries Board or the Fuel Administration. When materials are already on hand or are locally available, application for federal approval need not be made.

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THE MILES ACID TREATMENT AND OTHERS.

The report on the experiments conducted in New Haven with the Miles acid treatment of sewage seems to us to be a matter of unusual importance to sewerage engineers and cities which are or are likely to be required to adopt some method of treating their sewage. In several respects these tests seem to confirm the conclusion from previous ones that the acid method of treating sewage is a practical one under certain conditions. That all of the claims made by the enthusiastic promoters and early investigators are not substantiated will be a matter of little surprise to those who have followed the history of sewage treatment during the past twenty-five years, for there probably has not been a single method brought forward that has not proved to be less of a general satisfactory solution of the sewage disposal problem than had at first been supposed.

There appears to be no question that this treatment will secure the recovery of fats from sewage. It also seems to be demonstrated that the resulting sludge is comparatively inoffensive and that both it and the effluent are quite free from bacteria. On the other hand, certain disadvantages appear, among these the cost of the acid required; the difficulty of providing a plant for the treatment that will not be attacked by the acid; avidity for oxygen of the effluent, whereby the diluting stream or other body of water will be deoxidized to a considerable extent. It was claimed that the cost would be not only offset but even exceeded by the returns from the fat, but the New Haven experiments seem to show that these returns will be very much less than was supposed. If, during the present demand for fats and when the prices obtainable for fats are several times as great as before the war, the fats recovered by this process find little demand and can be sold at only a low price, if at all, because of the wax and other unsaponifiable substances contained in them, there would seem to be little hope that, with the return to normal conditions, any market at all can be found for this material except possibly at a nominal sum of one or two cents a pound. At the best, it is questionable whether the returns obtainable from the fats would more than offset the amount

by which the cost of this treatment exceeds that of plain or septic sedimentation.

It appears therefore that, as has been found to be the case with most other methods that have been tried, this one will not be found the most economical or otherwise advantageous under all conditions. On the other hand, however, conditions in connection with one of the sewer districts in New Haven were such that its advantages seem to outweigh the additional cost, and the same may presumably be found true in other instances. The particular conditions that recommend the acid treatment in this case are the inoffensiveness of the process and of the resulting sludge, thus permitting the plant to be located within the city at the sewer outlet; the acidity of the sewage from this district, thereby reducing the cost of this treatment; and the fact that Imhoff tank treatment would be very expensive at this particular location because of the depth of excavation required for the two-story tank. Also disinfection of the effluent is considered very desirable on account of the oyster plantings affected by it, which condition would otherwise have to be secured by treatment with chlorine or other disinfectants.

Another interesting feature of the report is the recognition of the fact that, while this treatment seems to be most desirable for the sewage from one section of the city, that from other sections might better be treated by some other methods. In other words, the investigators recognize that the same method may not be most desirable under all conditions, a fact that is generally admitted by engineers but is not always acted upon. In too many cases engineers become enthusiastic over some one method of treatment, although in no way interested in it from a financial or other point of view, and recommend it in almost every instance where their opinion is called for. We believe that there are few cases where it can be stated offhand that some one method of treatment would be more desirable than any other, but in each case the conditions affecting the problems should be carefully studied and compared with the relative advantages and disadvantages of all the methods of treatment that have been shown to be practicable.

Among other suggestions offered by this report is the one that, if there are available any processes for treating sewage in a manner so inoffensive that the plants can be located within city limits, then such processes deserve consideration even though their cost may be high. For ability to so locate a plant may make it possible to eliminate the cost of a long and expensive outfall which would be required if the plant must be located well beyond city limits.

ORGANIZE FOR SNOW HANDLING.

Winter snows will probably be here within two months, which is none too long a time for organizing to keep the roads clear, especially if such organizing involves the securing of any appliances. Motor traffic engaged in war work or which releases freight cars for carrying coal or munitions, and the moving of motor trucks under their own power from factory to seaboard, must be continued uninterrupted this winter. The Highways Transport Committee is now perfecting an organization of state, district and community officials to co-operate with the War Department to this end, giving their first attention to three main truck routes to Baltimore, one from Chicago, one from Detroit, and one from Buffalo via Albany. But all routes, long or short, now carrying important trucking traffic should be kept open.

One lesson taught by last winter's experience was the superiority of plows or other appliances over hand shoveling, and the difficulty of using the former once the snow becomes deep; hence the desirability of getting the plows out as soon as three or four inches has fallen. This means that the appliances must be ready and the crews organized for immediate service, day or night. Another lesson is the need for clearing wide tracks, both so that one stalled truck can not stop the entire train and also to furnish space for shoving aside succeeding snow-falls. Many suggestions will be found in Municipal Journal for Dec. 22, 1917, Jan. 12, Jan. 19, Feb. 16, and March 9, 1918.

LIABILITY FOR TRESPASS IN STREET WORK

Responsibility of City for Casting Earth Upon Private Property, for Removing It From Private Property, or Other Forms of Trespass.

By JOHN SIMPSON.

There is a large class of cases in which the rights of both the public and of individuals may be deeply involved, in which it cannot be known at the time the act is done whether it is lawful or not. The event of a legal inquiry, in a court of justice, may show that it was unlawful. Still, if it was not known and understood to be unlawful at the time, if it was an act done by the officers having competent authority, either by express vote of the city government, or by the nature of the duties and functions with which they are charged, by their offices, to act upon the general subject matter, and especially if the act was done with an honest view to obtain for the public some lawful benefit or advantage, reason and justice obviously require that the city, in its corporate capacity, should be liable to make good the damage sustained by an individual in consequence of the acts thus done. *Thayer v. Boston* (1837) 36 Mass. 511.

Whether a particular act, operating injuriously to an individual, was authorized by the city, by any previous delegation of power, general or special, or by any subsequent adoption and ratification of particular acts, is a question of fact, to be left to a jury, to be decided by all the evidence in the case. As a general rule, the corporation is not responsible for the unauthorized and unlawful acts of its officers, though done under color of their office; it must further appear that they were expressly authorized to do the acts by the city government, or that the acts were done *bona fide* in pursuance of a general authority to act for the city on the subject to which they relate; or that, in either case, the act was adopted and ratified by the corporation. *Thayer v. Boston* (1837) 36 Mass. 511. *Sherman v. Grenada* (1875) 51 Miss. 186. *Chicago v. McGraw* (1874) 75 Ill. 566. *Hunt v. Bronville* (1877) 65 Mo. 620.

Though these rules are plain and well settled, considerable difficulty has been found in their application to the acts of the officers of municipalities in connection with streets. Only an examination of the cases themselves will indicate the extent of a municipality's liability under a given set of circumstances. The cases naturally arrange themselves into trespasses by casting earth and stones, etc., on private property, removing these from private property for use on the streets, and the entering on private property in the erroneous belief that it is the property of the municipality.

For the purpose of improving a street for public travel, a city raised the natural grade in front of an abutting

owner's lots about twelve feet. The crown of the embankment was made the full width of the street. This could not be done without so depositing the earth that it rolled over upon the lots while the work of filling up the street was in progress. The effect of this filling up the street was that a large quantity of earth was deposited upon the front of the lots, and part of the owner's hedge was destroyed. The city was held liable in damages to the owner. The Iowa Supreme Court said, *Henderson v. Ottumwa* (1877) 46 Iowa 658: "No one would claim that the city, in making the embankment, had the right to enter upon the plaintiff's lots and deposit the earth directly thereon. This, beyond question, would be a trespass. It seems to us the city is equally liable for depositing the earth in the street in such a manner that, without ceasing its motion, it passed at once upon the lots. The only difference is that in one case the earth falls from the cart or wagon perpendicularly, and in the latter it descends at an angle. By the law of gravitation the injury is as direct and certain in one case as the other. In both cases it is a direct encroachment upon the soil of the adjacent lots, by depositing that upon the earth which was not there before." In an action by an owner against the city and its contractor, *Broadwell v. Kansas* (1881) 75 Mo. 213, it appeared that the grade of the street, as established by the city ordinance, was about on a level with the top of the plaintiff's house. In making the fill necessary to bring the sidewalks up to grade large quantities of earth rolled down upon the plaintiff's premises and against the wall of their house, the result of which was to crush in the wall and throw down the house. The Missouri Supreme Court said that, while the city would not have been answerable in the action if it were bottomed on the mere fact that consequential injuries had resulted to the plaintiffs because of the grading of the street by the contractor, the action was not for consequential damages, but for a direct and positive injury. "If the owner of a private lot should decide to fill it with earth, the fact that he had the legal and undoubted right thus to fill his own lot up to a certain level would not give him the right in so doing to dump earth on his neighbor's lot, either directly or incidentally, and we do not perceive that the city has any greater rights than would a co-terminous proprietor, in similar circumstances." This principle was applied in *O'Donnell v. White* (1901) 23 R. I. 318, a case where the facts were similar to those of the two immediately preceding cases.

The owners of a lot built a board fence across the rear of the lot, about twelve feet inside of the line of the abutting alley. The city passed an ordinance to grade the alley, which sloped down to the lot, and this was done by a contractor. The specifications for the work called for a fill of seven or eight feet on the alley line. In doing the grading the contractor filled the space between the fence and alley line with dirt and some of the fence was knocked down and covered up with dirt. The owners brought suit for damages for the cost of removing the earth, rebuilding the fence and erecting a retaining wall. The court instructed the jury that they should allow as damages the diminution in the market value of the property, unless they found the cost of removing the dirt and building the retaining wall would be less, in which case the latter should be the measure of damages. The jury returned a verdict in favor of the plaintiffs. On appeal, it was held, *Tegelen v. Kansas City* (1902) 95 Mo. App. 162, that the instruction given was proper.

A similar instruction as to the measure of damages in such a case was approved in *Bunker v. Hudson* (190) 122 Wis. 43. There a city council ordered a street graded to the established grade by the street commissioner

within whose charter functions such work fell. He did the work so as to bring the surface of the street to grade to its full width, whereby, there being no retaining wall, the filling extended upon the adjoining premises. The city was held liable for proximate damages resulting to these premises. Although the specific act was unlawful and unauthorized, it was nevertheless held the act of the city, for which it was responsible, since it was done in the course and as a part of the good faith performance of the work of grading under the general authority of the commission to act for the city in that behalf.

In an action against a city for damages sustained by an abutting owner in the course of an improvement of the street carried out by a contractor, it was contended that there was some evidence tending to show that some earth was deposited upon the plaintiff's land, and that this question, and the subsequent damages, should have been submitted to the jury. The amount of earth, if any, was trifling, and the damage nominal. It was held, *Fuller v. Grand Rapids* (1895) 105 Mich. 529, that the contractor's act of depositing earth upon the plaintiff's land was unnecessary, and not the natural result of making the improvement. The trespass, therefore, was one for which the contractor, and not the city, was liable.

An owner's remedy for such trespass is by action at law, and damages therefore can have no place in an equitable proceeding, unless germane to the suit or growing out of the proceeding complained of. Therefore it was held, in a suit to enjoin the collection of an assessment for a street improvement, in which also damages were sought for an alleged encroachment on the plaintiff's property, *Davis v. Silverton*, 47 Or. 171, that if in reality there was an encroachment upon the plaintiff's lots, it was not by design to widen the street beyond the true boundary, and it could not by any logical course of reasoning or principle involved invalidate the proceedings for the improvement of which the plaintiff complained.

A town in which the highways and bridges had been injured by a freshet voted that the selectmen be its agents to repair them, as it had authority by statute to do. Acting in execution of the purpose of the vote, the selectmen, by their servants, entered upon a farm without the consent of the owner, and took away stone from it to repair a bridge. By removing the stone they exposed part of the farm to be washed away by a river. It was held, *Hawks v. Charlemont* (1871) 107 Mass. 414, that the town was liable in tort to the owner of the farm.

A borough council adopted a resolution directing that all property owners on a certain street be given notice to lay sidewalks in front of their properties. The council had a committee of three on streets and bridges, which committee was created by ordinance and members appointed by resolution. The burgess, the street commissioner and the three members of the committee directed workmen to enter upon an owner's property, tear down and move back a fence, and construct a sidewalk. No application was made by petition to the court of quarter sessions for the appointment of viewers, and no ordinance was passed relating to the taking of the land. It was held, *Brink v. Dunmore Borough* (1896) 174 Va. 395, that the borough was liable in an action of trespass for the injury done to the plaintiff. The syllabus of the case reads: "Where a borough takes private property in an irregular manner and not precisely according to law, and does work upon it which is within the general scope of the borough's authority, it is liable in an action of trespass for the injury committed."

Sherman v. Grenada (1875) 51 Miss. 186, is a case where the agents' acts were neither authorized nor rati-

fied and the municipality was therefore held not liable. The following is a statement of the case: 1. The street commissioners were ordered to examine the condition of the streets, let contracts and report. 2. Although not so ordered, they proceeded to work the streets. 3. In repairing the streets they committed the trespass complained of. This was not in the line of their duty. It was without authority or direction of the mayor and aldermen. Knowledge of the trespass on the part of the mayor and aldermen was not shown. The street commissioners, without orders or authority, deliberately and of their own volition went outside their line of duty, entered, without the consent of the owners, upon a lot, from which they hauled soil for the repair of the streets. When called upon, the mayor and aldermen repudiated the trespass, and an investigation and report were directed. 4. Whether the repairs were adopted by the city authorities, and the acts of the street commissioners thus ratified did not appear; and that could not be presumed.

Action was brought against a city for wrongfully moving earth from the plaintiff's premises and digging a ditch thereon for the purpose of constructing a highway. The injuries complained of were done by the city's street commissioner, under the verbal order of the mayor. The trial court rendered judgment for the plaintiff. This was reversed on appeal. The court said it was evident the trial court found that the premises trespassed upon constituted no part of the public highway, otherwise judgment could not have been rendered in the plaintiff's favor. "Conceding the plaintiff's claim in this regard, and the finding of the court thereon to be correct, still, there is no authority in the charter of the city of Gallatin, or elsewhere, for the officer of the city, in pursuance of an ordinance, or otherwise, to enter upon private property and remove earth or other material therefrom, or in any other manner interfere therewith, for the purpose of improving the streets of said city, and the city cannot, therefore, be held liable for the acts charged."

In grading a street a contractor graded down four feet of an owner's lot into the street. The grading was done under specifications embodied in a contract in accordance with an ordinance. There was nothing in the ordinance, or contract and specifications, authorizing the contractor to take any part of the lot. The city was held not liable for the injury. *Calvert v. St. Joseph* (1906) 118 Mo. App. 503. Distinguishing the above case of *Broadwell v. Kansas*, the court said: "But it will be seen that the injury in that case was the legitimate result of filling the street in pursuance of a valid contract."

There is another class of cases which hold that if the officers or agents of a municipality, acting under its authority or direction in the exercise of its power to open and improve streets, through an erroneous belief as to the ownership of property, commit a trespass on or take possession of the property of abutting owners without complying with its charter or general statutory powers, the municipality will be liable in damages therefor. *Lee v. Sandy Hill* (1869) 40 N. Y. 442; *Sheldon v. Kalamazoo* (1872) 24 Mich. 383; *Weed v. Greenwich* (1877) 45 Conn. 170; *Woodcock v. Calais* (1877) 66 Me. 234; *Gordon v. Taunton* (1879) 126 Mass. 349; *Persons v. Valley City* (1913) 26 N. Dak. 342, 144 N. W. 675. But if it is not shown that the trespass were committed in the execution or performance of acts directed or authorized by the municipality, it will not be liable. *Hanvey v. Rochester* (1861) 35 Barb. (N. Y.) 177; *Manners v. Haverhill* (1883) 135 Mass. 165; *Cummings v. Lobsitz* (1914) 42 Okla. 704; *Moore v. Coal Township* (1914) 56 Pa. Superior Ct. 55.

The WEEK'S NEWS

Convict Road-Building in New Jersey—Influenza Epidemic Sweeps Whole Country—Police Shortage in St. Louis—Forest Fires Destroy Minnesota and Wisconsin Towns—City Manager Changes in Southern Cities—“Reconstruction” Improvements in Detroit—Service Before Dividends on Pittsburgh Cars—Canadian Provincial Aid for Housing—U. S. Shipping Board Urges Port Development—City Coal Yards in Denver—Cities Interested in Land Settlement for Soldiers.

ROADS AND PAVEMENTS

Convicts to Build New Jersey Road.

Trenton, N. J.—Under agreements approved by the attorney general's office and sanctioned by the state highway commission inmates of the Rahway Reformatory will be used in constructing part of route 1 in Metuchen, for which the contractor has been unable to obtain sufficient labor. The agreements between the highway commission and the state department of charities and corrections are designed to overcome the provisions of the law prohibiting the hiring of convict labor to any private individual or corporation. By using the inmates it will be possible to finish the work before cold weather sets in. The road is considered to be a military necessity, especially as the recent explosion made the Perth Amboy-Metuchen and South Amboy-Morgan roads nearly impassable. The men will be transported on motor trucks every morning from the reformatory to the place of work, a distance of six miles, and they will be returned to the reformatory every night. They will get 50 cents an hour, less the cost of supervision and transportation.

Highway Surveyed at Night.

Salt Lake City, Utah.—So great were the difficulties encountered in locating the seventeen-mile tangent on the Lincoln Highway in Utah, known as the Goodyear Section, and crossing the great American desert, that the work has necessarily been carried on at night. The sunlight reflecting from the fields of glistening salt and alkali is so dazzling that it blinds the eyes unless they are protected by dark colored glasses, and the rising heat waves distort the shapes of objects sighted and produce fantastic effects, making accurate survey work under the glaring desert sun almost impossible. These factors would result in inaccuracy and confusion unless proper methods were employed for establishing the lines. Under George F. McGonagle, state engineer, and member of the state road commission, this important tangent was established by signal fires at night. The connecting levels and transit lines have been run during the twilight hours. Construction of this new direct route, which will eliminate fifty miles of extra travel around the south end of the great American desert, is well under way. Men have been working double-shift and the job is about half completed. The grade is being raised upon the desert floor to an average of 3 feet, 18 feet wide. The road will be surfaced with gravel. The cost will be \$125,000, money being furnished by the Goodyear Tire & Rubber Co., Akron, O., and F. A. Seiberling, president of the company and also of the Lincoln Highway Association.

Force Account Grading Cost Low.

Davenport, Ia.—Grading done by city forces saved the city \$638.07 in the first nine days of operations, according to figures compiled by street commissioner John Heeney and city engineer Roscoe E. Sawistowsky. An average cost was fixed of 28 cents a cubic yard. This includes depreciation on the city tractor, and numerous repairs on the rented elevating grader. The city's grader is working now, and the rented machine has been returned. The figures submitted by officials are based on the grading

of Garfield street. The operating report says: “Since there has been considerable deprecatory talk regarding the city not being able to do its own grading as cheap as contractors, we feel that the taxpayers of Davenport are entitled to the facts. The first job completed was the grading of Garfield street from Harrison street to a point 130 feet west of Western avenue. The amount of dirt moved by the city by actual measurement was 3,982 cubic yards. The lowest bid received on this job from contractors was 44 cents per cubic yard, which would be \$1,752.08 for the yardage moved. The cost to the city for moving this dirt is as follows.

All labor and teams.....	\$863.37
345 gallons kerosene at 11.7 cents.....	40.37
30 gallons lubricating oil at 37.5 cents.....	11.25
Rent of elevating grader.....	120.00

Total..... \$1,034.99

Or 25.9 cents per cubic yard. The above does not include any depreciation on traction engine or repairs for same, there being no cost to the city for repairs, to date, on the traction engine, but in preparing an estimate of the true cost of operation it is necessary to add to the above cost an item for depreciation and repairs based on 50 per cent depreciation on an investment of \$3,514.80 the first year of 200 working days, amounting to \$8.78 per day. Owing to the delay incurred through the use of the old rented elevating grader, which was always breaking down, and which by the way will not be used any longer, as the new machine has arrived, we will compute the amount for depreciation and repairs on the tractor for nine days at \$8.78, or \$79.02. Adding this amount to the above cost of \$1,034.99 give a total cost for the job of \$1,114.01, or 28 cents per cubic yard, a saving to the city of \$638.07 on this job in nine working days.”

SEWERAGE AND SANITATION

Stronger Fight Against Increasing Influenza.

Washington, D. C.—The general influenza situation throughout the country appears to afford little real indication of abatement anywhere, while the disease is spreading rapidly and involving more and more places more seriously. There would seem to be slight hope in the apparently stationary and decreasing totals of new cases in the army camps and in the more affected parts of Massachusetts, but nothing certain is shown by the figures. Influenza and pneumonia in army camps made the death rate among troops at home stations higher during the week ending Oct. 4 than in any other week since the mobilization began last fall. The Surgeon General reported that the rate increased from 32.4 deaths per 1,000 for the week ending Sept. 27 to 81.8, or more than 150 per cent. During the week ending Sept. 20, before the influenza epidemic began, the death rate was only 4.4 per 1,000. Intensive training and other strenuous work at all army camps was ordered discontinued by Acting Secretary of War Crowell. The order will be effective until the epidemic subsides. Supplementing his estimate that 25 to 30 per cent. of the population, or one person in every four, may be expected to have influenza, Surgeon General Blue declared that records of the Public Health Service show

that only 4 per cent. die from the disease. The U. S. Public Health Service has announced that it now is mobilized for a national campaign against the influenza epidemic. Surgeon General Blue has telegraphed all state health authorities suggesting that they organize, in as effective manner as possible, locally available resources, especially nursing personnel. He also suggested that all possible use be made of women who have not had regular training in order to diminish to some extent the demands made upon the doctors and nurses of the country, who now are badly overworked. The campaign of the Public Health Service to check the disease among the civilian population is rapidly being developed. Nearly 250 physicians are in the field, and headquarters have been organized in more than thirty cities in the Eastern and Southern states. The Volunteer Medical Corps of the Council of National Defense and the American Red Cross are actively co-operating with the health service in its campaign in New England, Pennsylvania, New Jersey, Delaware, North Carolina, South Carolina, Tennessee, Florida and Mississippi, as well as in Arizona and Montana. In other states local headquarters have been established in many cities. Headquarters for the campaign in Illinois have been established at Chicago, while Raleigh has been made headquarters for operations in North Carolina, and Columbia for those in South Carolina. Additional cities to which physicians of the public health service have been sent include Anniston, Ala.; Avery Island, La.; Kiser, Va.; Pulaski, Va.; Bradford, Ill.; Helena, Mont.; Maybrook, N. Y.; Nashville, Tenn.; Newberry, S. C.; Winslow, Ariz.; Baltimore, Md.; Columbus, Ohio, and Richmond, Va. Reports show that all parts of the country are attacked. Even where cases have only begun to be reported the health officials are taking precautions, and are closing schools and discouraging all public assemblages. Education of the people in precautions and treatment has been recognized as a necessity, and all kinds of publicity methods are being used. Newspaper advertising has been used effectively in a number of communities, including Massachusetts, over the name of the state health department; Passaic, N. J., and Detroit, Mich., by the local health boards. In the latter case a full page was used, explaining the symptoms, precautions and home treatment of the disease in clear language.

New York, N. Y.—There is no let-up in the number of new cases reported. During the 24 hours ending 10 a. m., Oct. 14, 4,217 new cases of influenza, 400 new cases of pneumonia, 222 deaths from the former and 235 from the latter were reported. To better organize the city in its fight against the spread of the epidemic it was decided by the Emergency Advisory Committee to divide the city into districts. The suggestion came from the Academy of Medicine and Dr. Lee K. Frankel, who represents in the advisory committee the various social service agencies of New York. "The city is to be divided into districts. We shall use for that purpose the district subdivision recently gotten up by the Community Council of National Defense, which has prepared maps for all the boroughs. We shall put into each district a representative to be in charge of all the agencies in that district. We shall try to find districts with a plant, where cooking can be done, so as to supply families where there is illness and the people are unable to care for themselves in connection with supplying food. Under the community district plan agencies and the people in the districts can help in many ways. For instance, they can help in the carrying forward of propaganda and in education along prophylactic lines. There can be organized by the people emergency vigilance committees to report all infractions of the sanitary laws. The people can also assist by finding out unreported cases in the homes, and they can see that such reports reach as quickly as possible the agencies for relief. There will be a total of forty-five large districts, and an executive committee will be appointed for supervisory purposes." The plan had also been urged by former health commissioner S. S. Goldwater, who said: "The doctors who are seeing from forty to fifty cases of influenza and pneumonia a day, and who are compelled to refuse numerous additional

cases are wasting half their time and strength travelling about from place to place. This is a plan which I understand has been worked out of the Department of Civilian Relief of the Red Cross to meet epidemic conditions in the smaller communities which are calling for aid. For each zone there should be headquarters. Attached to such headquarters should be physicians, nurses and aids. Each district, of course, must have its motor service. In order to conserve the doctors' time, nurses will be sent to see cases first. Upon the urgency of the case as shown by their report will depend the order of the doctor's visits. Hospital care would be organized similarly in accordance with the zone plan. Districts insufficiently supplied with hospitals would be combined with others in which hospital provision is relatively plentiful. New steps taken to prevent spreading of the disease include barring of all children under 16 years old from theatres and stopping of new moving picture "releases" for four weeks. The public service commission has asked that telephone calls be limited to essential ones, as a large proportion of the operating force of the telephone company is on the sick list. The condition throughout the state is growing as serious as that within the city, new cases being reported at the rate of about 10,000 a day. So serious had become the epidemic in the village of Maybrook that the state police took charge of the situation. There were 365 cases, with seven deaths, reported. Nine state troopers were hurried to Maybrook in response to an appeal from the town and state health departments. They immediately ordered churches, schools, theatres and halls closed. Then they patrolled the roads, and would not let any one out of Maybrook unless they appeared to be in sound health. Likewise visitors were warned against going in. At Elmira health officials have been puzzled and worried by the appearance of four unrelated cases of infantile paralysis in addition to the influenza.

Boston, Mass.—The influenza situation in Massachusetts appears to be stationary, while the number of deaths in the state outside of Boston is now slightly lower than it has been. In many places where the epidemic has been particularly virulent there was marked improvement, but this is offset by an increased number of new cases in other communities, particularly in the central and western parts of the state. In Quincy and Gloucester, where there have been many thousand cases, there were no deaths from influenza or pneumonia in the twenty-four hours ended at noon, Oct. 9, and no new hospital cases. Improvement is also reported from Salem and cities in Rhode Island.

Philadelphia, Pa.—It is thought by Dr. Wilmer Krusen, director of public health and charities, that the epidemic of influenza which has caused thousands of cases and hundreds of deaths is now abating, although new cases are still being reported at the rate of over three thousand a day. The zone system of treating the cases is to be installed here with the approval of physicians. Following attacks by prominent medical men attention has been turned to the filthy condition of the streets, and the street-cleaning contractors are being jolted into action. The disease is also taking a heavy toll of the shipyards. Gloucester City and Camden, N. J., are suffering fearfully. In the latter town the city physician, Dr. John K. Bennett, died of the disease.

Trenton, N. J.—Mandatory orders to local health authorities throughout New Jersey to close "all churches, theatres, moving picture houses, dance halls, saloons, soda fountains and other places where numbers of people congregate" have been issued by the state department of health as a measure to control the spread of influenza in New Jersey. The state department of health order also advises the closing of schools, where the disease is epidemic, urging health officers to bring this advice to the attention of school boards. The disease is spreading rapidly in a number of communities. In the Amboy district, in which the big T N T explosion occurred, conditions are especially serious. The Red Cross has advertised for

physicians from outside, offering \$50 a week, with maintenance and expenses.

After-Care of Infantile Paralysis in Illinois.

Springfield, Ill.—Restoration to lives of usefulness of children suffering from effects of infantile paralysis and consequent saving of thousands of dollars to the state of Illinois is the result of the work of the state department of health, according to Dr. C. St. Clair Drake, director of the department, who has just made public figures covering work of the fiscal year ending June 30 last. An average of 175 patients weekly, according to the report of the division of child hygiene and public nursing, have been treated in clinics outside of Springfield, and thirty additional in the capitol city, making a total of 205. Dr. Clarence W. East, chief of the division, has organized the work, and has established clinics in Chicago Heights, Blue Island, Oak Park and Evanston in Cook county, Ottawa, Rock Island, Moline and Quincy, and a main clinic at St. John's hospital at Springfield. A service has been maintained at Joliet, and the cities of Danville and Casey are considering the establishment of clinics in the near future. In the work, Dr. East was assisted by Mrs. Esther Warner, public health nurse. Intensive effort in the prevention and care of infantile paralysis began in Illinois two years ago when an epidemic was prevalent. In the summer of 1916 there were a total of 890 cases reported in the state. In 1917 the number was 864, of which 575 were in Cook county. Up to July 31 of the present year a total of 139 cases had been reported throughout the state, fifty of which developed during July, the disease being a strictly hot weather one and practically disappearing with the approach of cold weather. Bearing out this statement of the health department, in May, 1916, there were three cases of infantile paralysis in three counties of Illinois. By July the number had jumped to 143 cases in 40 counties; August, 308 cases in 54 counties. September showed a decrease to 162 cases, October, 84; November, 19, and December, 9. In discussing the report for the past year, Dr. Drake said he considered the work the department of health was doing in correcting deformities due to infantile paralysis to be perhaps the most important new activity in which it was engaged. Dr. East declares interest in the reclamation work has been stimulated in all classes of people. "County and city authorities," he stated, "clubs and individuals have contributed to the brace and supply fund. No child for whom a brace, surgical operation or hospitalization has been necessary has had to do without it." Dr. East says "ninety per cent of patients registered with our clinical service is continued with it to the end of the service."

FIRE AND POLICE

Garbage Plant Destroyed by Fire.

Waco, Texas.—The city garbage plant has been practically destroyed by fire. The city carried no insurance on the plant, and must bear the entire loss. According to fire marshal Dan Nicholson, the negro who was tending the furnace at the time of the fire said that the big pit had been filled with scrap paper. The paper was not burning well, and great clouds of smoke were pouring out. All at once a loud report came, and flames burst out all over the plant. Everything was consumed save the actual brick and iron of the furnace. In order to extinguish the blaze the firemen had to lay a line of hose 2,800 feet long.

Special Policemen to Fill Ranks.

St. Louis, Mo.—The "emergency special" police force introduced to St. Louis during the World's Fair in 1904 has been renewed by the police board. Between 50 and 60 specials will be put on the forces as soon as available. The board decided that owing to police officers entering the army or navy, an emergency existed which, under the law, empowered them to create the "special." The age limits for this type of officer were fixed at from 24 to 50 years. The limit for regular policemen is 40 years. The "emergency specials" will not be allowed the privileges

of the Police Relief Association membership; will not be subject to the stringent examination of the regular probationary, and can be dropped from the force without trial by the board. The salary was fixed at \$75 per month.

15 Per Cent Salary Increase for Police and Firemen.

Battle Creek, Mich.—Salary increases of 15 per cent have been granted members of the police and fire departments by the city commission. The raises, which are already effective, increase the salaries of first year firemen from \$23.10 to \$26.56, men in service over a year being boosted from \$24.84 to \$28.56. In the police department, first year patrolmen now receiving \$23.10 will get \$26.57, and patrolmen after the first year of service are boosted from \$24.84 to \$28.56. Detectives, sergeants, the chauffeur, electrician and matron also figure in the 15 per cent increases, which places the salaries of detectives and sergeants up to \$30.55, their salaries prior to the increase being \$26.57. Increases for captains and lieutenants were not mentioned in the petition of either departments for better pay, but they were allowed increases along with the others.

Hundreds Die as Forest Fires Sweep Towns.

Duluth, Minn.—With a toll of between five hundred and a thousand persons dead, thousands homeless and without clothing, and property damage amounting far into millions of dollars, whole sections of northern Wisconsin and Minnesota timber land were left smouldering, fire stricken wastes, with the charred ruins of abandoned towns by terrific forest fires. The bodies of hundreds of victims were taken to Duluth morgues. Twelve thousand homeless and penniless refugees, all in more or less need of medical attention, were quartered in hospitals, churches, schools, private homes, and the armory here, while doctors and nurses sent from surrounding communities attended them. Nearly every able-bodied man in the city was conscripted to fight the flames. Over practically every foot of the district swept by the fires the devastation is complete, and the few farm buildings left standing in the thousands of square miles of Northern Minnesota mark the freaks of the flames. Twenty-one towns totally or partly destroyed are: Cloquet, Moose Lake, Kettle River, Lawler, Adolph, Munger, Five Corners, Harney, Grand Lake, Maple Grove, Twig, Barnum, Mathews, Atkinson, French River, Clifton, Carleton, Brookston, Brevator, Pike Lake, and Pine Hill. Bemidji reported a small loss. The fire loss to the city of Duluth is estimated at \$750,000, nearly one hundred buildings having been destroyed by flames which started in eastern suburban districts from sparks. The Duluth Country Club and the Children's Home, one of the largest structures of its kind in the states, were total losses, and the fire swept Woodland and Lester Park, recreation centres. The fire also destroyed one approach to the interstate bridge, which connects Duluth with Superior, the Wisconsin city across the St. Louis River from here. Automobile parties dashed through a wall of flame to rescue 200 tuberculosis patients at the Nopeming Sanitarium, which was partially destroyed. The patients were taken out with the greatest difficulty, fire having partly cut off the rescuers' retreat, but it was said that probably none would suffer any ill effects. The charred bodies of hundreds of victims were found on the roads leading out of the towns and brought into the city by motor trucks. Several burned automobiles filled with bodies were found by the rescuers. Many of the dead could not be identified, and the thousands of refugees passed through the morgues searching for their dead. Many persons also are believed to have been drowned in lakes in which they took refuge from the terrific heat, thinking the fire might pass them by. Many refugees here, in a serious condition from exposure, said they stood for hours in ice-cold water while the flames raged above them. Rural residents, refugees say, got but a moment's warning before the fiery hurricane swept down upon them. A pall of smoke had hung over the countryside for hours, and a majority believed the flames to be merely the "fall fires," which are annual occurrences. When the danger

became apparent, they rushed into cellars or huddled together wherever a slight depression in ground seemed to promise protection. Whole families were found suffocated, their bodies charred. In a majority of cases, physicians say, death was caused by suffocation. A special train of twenty coaches brought 1,500 refugees from Cloquet and Carlton. Albert Michaud, a special policeman, told a tragic story of the burning of Cloquet. "At 6 o'clock a forest ranger gave warning that unless the wind died down the townspeople would have to flee. A thick pall of smoke hung over the town, and at 7 o'clock the special 'rains' were called. The scene at the station was indescribable. There came a rush of wind, and the entire town was in flames. The trains pulled out with the fires blazing closely behind them. Women wept and clung to their children, while others cried frantically for their missing ones. The flames licked at the cars. Windows in the coaches were broken by the heat. The engineers and firemen alternately stoked to give the boilers all the fuel they could stand. Other trains were hurriedly made of flat cars, box cars, and anything that would roll. But even then all did not get away." Cloquet was a town with about 7,500 population. More than 4,700 persons were brought to Duluth and Superior from there alone.

GOVERNMENT AND FINANCE

Manager Plan for Georgia City.

Griffin, Ga.—The three candidates for positions on the first commission under Griffin's new commission manager charter, nominated in the recent primaries, and who are considered among the best and most public spirited business men of the city, were selected by a somewhat unusual procedure. A general mass meeting was held at the city hall a week before election. A "straw vote" was taken and those receiving the three highest totals were declared the candidates of those present at the meeting. These three candidates in the primaries received the overwhelming majority of the votes cast. In Georgia, the nominees of the Democratic primary are certain of election at the succeeding general election, held in December. The nominees are J. W. Gresham, a prominent manufacturer and ex-mayor; R. F. Strickland, a wealthy merchant-farmer-banker; B. B. Brown, a self-made business man of wealth. A city manager will be selected in December to take office January 1. Griffin is the first city in Georgia to adopt the new plan.

Two More City Managers in Army.

Charlottesville, Va.—Hubert A. Stecker who has served as city manager of this city since January 1, 1917, has resigned to enter the army service. His administration has been most successful. His duties in the army are somewhat analogous to the work of a city manager. He has been commissioned captain in the quartermaster corps and placed in charge of streets, buildings, and grounds at Camp Logan, Texas.

Goldsboro, N. C.—E. A. Beck who has served as city manager since the new plan was put in operation July 1917, has been commissioned as captain in the sanitary corps of the army, and is stationed at Fort Oglethorpe, Ga. Mr. Beck's work has received most favorable comment. It will be recalled that Mr. Beck was selected from a field of 522 candidates for the position of manager at Goldsboro. Prior to his appointment he had served as manager and engineer for the boroughs of Sewickley and Edgeworth, Pa. No successor is announced.

Detroit's After-the-War Improvements.

Detroit, Mich.—According to a statement by the Detroit Bureau of Governmental Research, of which Lent D. Upson is director, "Detroit is about twelve million dollars behind in necessary improvements, the city's need for men and materials being less urgent than is that of the nation." The city's improvement program as provided in the budget for 1918-19 amounts to \$14,782,720.25. To this should be added \$5,729,000.00 projected

for the several years previous but for which bonds have not been sold—making a total of \$20,511,720.25. Of this, \$2,445,720.25 has been raised by taxation, leaving \$18,066,000.00 of need improvements to be furnished. All of these securities must, of course, be approved by the Federal Capital Issues Committee before being sold. The city controller has asked consent to issue these bonds for the following purposes:

For schools	\$5,823,000.00
For sewers	7,615,000.00
For library	750,000.00
For hospitals	1,320,000.00
For buildings	2,318,000.00
For parks and boulevards.....	240,000.00

Total \$18,066,000.00

To date the Federal Capital Issues Committee has sanctioned the following:

For schools	\$3,173,000.00
For sewers	988,700.00
For library	750,000.00
For tuberculosis hospital.....	350,000.00

Total \$5,261,700.00

The amount allowed for schools covers payments which were contracted in 1917-1918; and \$772,000 for portable school buildings and sites to relieve congested districts. The amount allowed for sewers covers receiving basins, \$200,000; sewer arms, \$150,000; to complete Third st. sewer, \$171,000; to cover work done in 1917, \$467,00.

The bureau points out that the situation presents an opportunity for the next mayor to arrange "all deferred improvements so as to facilitate in the greatest way the return of soldiers to industry."

TRAFFIC AND TRANSPORTATION

Court Orders Better Service.

Pittsburgh, Pa.—Judge Charles P. Orr of the Federal district court has announced a decision in the case of the Pittsburgh Railways receivership, approving immediate compliance with joint demands for better service made by officers of the army and navy and the state public service commission and ordering that the receivers defer the payment of certain of the fixed charges. Of the ten separate items of fixed charges presented by the receivers Judge Orr ordered five, totaling \$38,760, paid, and directed that payments be deferred in five items, amounting to \$72,495. Admitting they did so on demand of the army and navy, and the public service commission, the receivers appeared before judge Orr and asked authority to set aside \$374,668. Judge Orr indicated a willingness promptly to authorize the expenditures, but pointed out that injunctions had previously been obtained against two of the improvements. Attorneys for the receivers set out immediately to have these injunctions waived and secured the withdrawal of one action the same day. The court then approved the expenditure. In a previous decision, the receivers were allowed by judge Orr to pay \$247,075 fixed charges due its chief underlying company, the Consolidated Traction Company, for August, and \$31,465 for similar charges for the month of September. The payments had been protested by the city of Pittsburgh, near-by boroughs and one of the three receivers for the company. They maintained that the money should be expended for needed improvements. The matter of the payment of the fixed charges came before the court in the form of a petition for advice on what to do regarding payment. In a supplemental petition Receiver Fagan protested against the payment. This brought forth a petition from the Consolidated Traction Company, backed up by the majority receivers, that the fixed charges due the com-

pany be ordered paid. The court upheld the right of the Consolidated Traction to intervene because of its claim to ownership of a considerable part of the property embraced in the Pittsburgh Railways system. The court said in part:

"The legal position of the Consolidated Traction Company is that the receivers of the Pittsburgh Railways cannot retain the property of the Consolidated Traction Company in their possession and also keep the income derived by the receivers from the operation of such property. The discussion of this legal position at any length is unnecessary.

"Before receivers are required to elect whether or not they will affirm a lease entered into by an insolvent corporation prior to their appointment, they are entitled to a reasonable time to determine whether the assumption of the obligations of the lease would be beneficial to the trust. What is a reasonable time within which receivers may declare such election varies in almost every case. The present case in one necessarily involving great perplexities.

"These underlying companies want some share of these returns as compensation for the use of their properties. Some produce a substantial net income while some do not. At the present time all properties comprising this system operated by the Pittsburgh Railways are being valued. Until such valuation are obtained, it will be difficult even to take the first step toward a solution of any of the perplexing problems which confront the parties interested. There should be no election therefore by the receivers to affirm or disaffirm any of the contracts entered into by the Pittsburgh Railways with subsidiary corporations until after the valuations of the various properties comprising the system have been completed. Therefore, the Consolidated Traction Company is not entitled at present to the return of its properties.

"Nor is the petitioner entitled, as a matter of right, to the alternative of the prayer. In other words, it is not entitled to have payment of the sums named in the lease because its property is retained by the receivers. If it be entitled to any moneys at all, because of its interest, it will be entitled to them solely because the receivers have more money in their hands than they will be able to spend within a reasonable time, in placing the various properties under their control in condition properly to perform the duties owing to the public. At the time of the hearing the court expressed the view that the interests of the public were paramount to all others.

"The principle is well recognized that before moneys shall be applicable to the payment of interest to bondholders or dividends to stockholders, the duties toward the public should be performed. Therefore, in the present case it is the duty of the receivers to discharge the obligations of the Pittsburgh Railways to the public before discharging the obligations to investors.

"The receivers have in their hands now more money than they can spend at the present time or in the near future, and the moneys in their hands are increasing greatly. To withhold all of said moneys from those who own the properties would be to penalize them for something for which perhaps they are not responsible. If enough and more, that is to say sufficient funds are retained in the hands of the receivers to meet the expenditures which they can within the near future incur in the performance of their duties as herein outlined, the surplus distributed from time to time in the discharge of obligations to investors.

"The order for the payment of this money is not to be deemed an order for a continuance of similar payments to the same company as they may mature hereafter. There may be other underlying obligations that may require similar treatment. Such payments as may be made will be made by order of this court and should be separately charged against the particular properties to which they may be applicable, so that upon any reorganization the respective charges and the respective values may have consideration."

State Commission Need Not Assume Fare Jurisdiction.

Atlanta, Ga.—Judge George L. Bell, of the Fulton superior court, has given out a decision denying the petition of the Georgia Railway & Power Company for a writ of mandamus against the state railroad commission to compel the commission to assume jurisdiction in the matter of street car fare increases. The company wishes to secure authority to charge a 6-cent fare, with 2 cents extra for each transfer. Some time ago the railroad commission handed down a decision granting electric light, power and gas rate increases to the company, but refused to consider the petition for an increase in car fares. The commission held that under the law it had no authority to alter the schedule of car fares in the city of Atlanta for the reason that those fares were fixed by a contract between the municipality and the power company, which had been consummated some years before the organization of the commission on its present basis. The company then filed with Judge Bell a petition for a writ of mandamus to compel the railroad commission to assume jurisdiction in the fare matter. The case will be appealed to the supreme court of the state for a final construction of the law governing the situation.

CITY PLANNING AND HOUSING

Canadian Provincial Loans for Housing.

Toronto, Ont.—Government action looking to the alleviation of the shortage of workmen's houses in the province has been announced by Sir William Hearst. An appropriation of \$2,000,000 has been set aside by the provincial government, which will be available to both rural and urban municipalities at the interest rate of five per cent. The terms are: 1. The total amount loaned by the province shall not exceed \$2,000,000. 2. Any municipality receiving a loan from the government must add at least 25 per cent to the amount received, so that for every \$1,000 received by way of government loan at least \$1,250 shall be expended in house construction. 3. The money shall be loaned to the municipalities by the provincial government on the credit of the municipalities as may be arranged. 4. The rate of interest payable by the municipalities shall be 5 per cent per annum.

Municipal Docks Completed.

St. Louis, Mo.—The completion of the first unit of the new municipal docks at North Market street has been announced by Director Hooke, of the Department of Public Utilities. The first unit is 182 feet long and 36 feet wide, and will form about one-fifth of the entire dock, which will be 900 feet long. With the completion of this unit three barges can be accommodated at one time. Government-owned barges are already in operation on the river. The Heman Construction Co., which held the contract for the dock, relinquished the contract July 20, and the work of the first unit was completed in 43 working days by workmen employed directly by the city under the direction of W. H. Smith as chief engineer.

Vast Expansion of Port Facilities by U. S. Shipping Board.

Washington, D. C.—According to a statement by the Shipping Board: "Along with the record-breaking production of ships for the war—and after—the Shipping Board has undertaken the task of expanding the port and harbor facilities of the country to meet the needs of the greatest maritime commerce of modern times. A doubling, and perhaps trebling, of docks, piers, marine railways and terminal facilities in general of Atlantic, Gulf and Pacific ports will probably be called for by the swiftly increasing American merchant marine. To provide for the fullest possible service of the ships, once they are released from war traffic, even new ports may become necessary. These are the prospects as they are already shaping up in the preliminary studies of the situation which have been made by the recently created Port and Harbors Facilities Commission of the Shipping Board. Edward F. Carry, named chairman of this commission because of his experience as director of the Division of Operations of the Shipping Board, will have before him shortly complete data of the present inadequate facilities. The comprehensive survey instituted by the commission will be a constantly used basis of study for future developments. In connection therewith the chairman and the experts attached to the commission will personally inspect the facilities at all the larger ports of the country, and from time to time, as the occasion may arise, obtain first-hand information on proposed new ports. To date they have given the harbors of New York and Boston thorough examination, and they plan to make visits soon to the rapidly growing ports of the South. For the first time in the history of port development in the United States, under the direction of Chairman Carry, a complete inventory of port facilities has been undertaken, and is now well along. Every port used by ocean-going traffic has been requested to forward to the Port Facilities Commission detailed data concerning its docks, marine railways, terminal arrangements and general repair plants, and the entrances and clearances in its domestic and foreign trade—all this data covering the past five years.

In addition every dock and repair plant has been requested to fill out a questionnaire calling for information concerning

the type of its facilities, present condition, exact location, whether or not this location is advantageous for the most efficient handling of ships, the terms, rates and conditions on which ships are docked, the number of ships docked during the past five years, the average length of time each ship was in dock, and for a brief statement explaining the nature of work done.

All ports where coal and oil are handled have been asked to equip the commission with full information about their facilities for handling the trade in those first necessities. Here is perhaps the most important of all the coastwise trades in which past performances have been handicapped by inadequate facilities—a trade, as revealed during 1917 and the present year, limited only by shipping and port facilities. One of the immediate tasks of the commission is to expand these facilities so that the bulk of coal for New England war industries may be expedited by water.

The survey of port facilities undertaken by the commission shows them taxed to capacity by the present shipping—in many instances overtaxed, and in nearly all instances, unless they are speedily expanded, facing serious congestion. This is especially true of the facilities of New York harbor, the greatest problem of port development in the world today. To a lesser degree some of the southern ports show congestion in sight unless the national government expands their facilities.

Among the larger problems of shipping up for profound and detailed study before the commission is the diversion of imports and exports from northern to southern ports, especially those going to and from the Middle West. Hitherto they have passed through the port of New York, thus increasing not only the burden of the facilities of that port, but of the badly congested railroads along the north Atlantic seaboard and in Pennsylvania and Ohio. In the future, to relieve the congestion of the port and eastern railroads, other routes may be supplied—to the Middle West, for example, via southern ports, railways and waterways.

A great deal of the enormous trade in sight with South America is prospectively considered in relation with the ports of the South, and if plans for this diversion go through the expansion of water-front facilities in that part of the country becomes of front rank importance.

All the Pacific ports, if British shipping history points a moral, face likewise notable expansion of trade with the Orient, and therefore of port requirements far beyond all prewar plans.

Since the development of port facilities links up with the railroads, the Railroad Administration is represented on the Commission on Port and Harbor Facilities. The plans and policies of the Shipping Board co-ordinate with those of the Railroad Administration to give ports in the future a closer connection between shipping and railroads than they have ever had in the past. Port development on both sides—land and water—becomes easier with shipping and railroads under government control. And for the first time, with both great methods of transportation under government direction, the studies of what is needed to take care of requirements is accompanied by equally detailed tabs on what is being done—on the railroads by what each car is doing, on the water by what each ship is doing. So that the Port and Harbor Facilities Commission is equipped to measure not only what the port facilities are doing, but what the ships are doing in ports. Their needs can thus be determined exactly in relation to one another and so matched. They can also, of course, be determined in relation to accurately measured railroad facilities. The task assigned to the Port and Harbor Facilities Commission of developing the water fronts to keep pace with the expansion of shipping has aroused tremendous interest on all three coasts, and existing port organizations, state and local, have offered to co-operate fully. Keenly alive to the peace-time significance of the great shipbuilding program of the country they realize, as their communications to the commission reveal, the prime importance of the expansion of their port facilities to handle the prospective commerce adequately."

Government Housing in Pittsburgh.

Pittsburgh, Pa.—Work is soon to begin on what is said to be the greatest housing project in the world, to be undertaken on Neville Island, near Pittsburgh. A Philadelphia firm of architects have been employed. Zantzinger, Borie & Medery, of this city, has been commissioned by the department of industrial housing and transportation of the United States to design the community. The island will be the home of workers in the Government ordnance plant which is to be erected on the island. The plant will employ from 20,000 to 25,000 men, and the building and equipment will cost about \$50,000,000. The housing project means that a complete city will be built, having a population of

50,000. It will call for construction of 15,000 separate dwellings. The building is to proceed at once, and some dwellings will be ready for occupancy before summer. The architects are also architects for the housing project at the Bethlehem Steel Company's plant. Neville Island is in the Ohio River near the point where the Monongahela and Allegheny Rivers enter. It is seven miles long and one mile wide, and on the banks of the river on either side of the island runs a railroad, the New York Central on one side and the Pennsylvania on the other.

MISCELLANEOUS

Two New Municipal Coal Yards Opened.

Denver, Colo.—The municipal coal department has opened the first two yards to be controlled by the department, and distribution from these yards has begun. There is also a third yard, that of the Liberty Fuel Company, which handles city coal, but it is now owned by the city. Coal orders will be received at these three yards, and also at city hall, and prompt delivery is assured. Mayor Mills is confident that the coal department will be even more successful this winter than last.

Commission on Land Settlement for Soldiers.

Minneapolis, Minn.—The Northwestern Commission on Land Settlement for Returning Soldiers is the name agreed upon in perfecting the ground work for an organization to be formed to deal with the Interior Department as a result of a conference held recently in Minneapolis attended by land development men and representatives of commercial bodies of the states of Michigan, Wisconsin, Minnesota, North and South Dakota and Montana. A survey of the vacant lands in the Northwest is to be made at once, and the information will be placed in the hands of the Northwestern Commission for presentation to Secretary Lane, of the Interior Department. It is estimated that there are over 30,000,000 acres of land in these states of high productive value. The following program was decided upon in order to perfect the commission's organization on a most effective basis: 1. The Northwest Commission will be composed of two men from each of the following states: Wisconsin, Minnesota, North and South Dakota, Michigan and Montana. 2. Members of the commission will make a compilation of the facts concerning the unused lands in the state. 3. Five representatives in each state will constitute a committee to organize the state, later to be organized into a state commission, the state commission to select two members of the Northwest Commission. The temporary committee for Wisconsin agreed upon by those in attendance from this state, which committee will select the five representatives for the state, was as follows: W. G. Bissell, president Wisconsin Advancement Association, Milwaukee; Dean H. L. Russell, Madison; mayor Fred Baxter, Superior; R. F. Brown, Ashland, and F. W. Luing, Milwaukee, with B. C. Packer as temporary state secretary. It was the unanimous opinion of those in attendance at this conference that state legislation will be necessary to take care of the expenses of organizing the farming assets of the states in the Northwest, and this matter will be left to the several states to be worked out in accordance with their local situations.

Municipal Laundries in South America.

Montevideo, Uruguay.—According to a law passed recently the Uruguayan Government is to construct municipal laundries or washing places (lavaderos) in all the cities of the republic. These buildings are to be completed within four years and are to be erected in series of four, the first four to be built in Salto, Paysandu, Mercedes, and San Jose. The Government is authorized to expend not to exceed 22,000 pesos (\$22,750) per year for the purpose. If the municipalities have the necessary funds, they may construct their own washing places, which must, however, conform to the requirements of the Government. The buildings will, after completion, be turned over to the municipalities.

NEWS OF THE SOCIETIES

Oct. 15-19.—LEAGUE OF CALIFORNIA MUNICIPALITIES. Annual convention, Riverside, Cal. Executive secretary, W. J. Locke, Bureau of Municipal Reference, Alameda, Cal.

Oct. 17-19.—KANSAS PUBLIC SERVICE ASSOCIATION. Annual convention, Kansas City, Kan. Secretary, W. W. Austin, Cottonwood Falls, Kan.

Nov. 6-8.—CITY MANAGERS' ASSOCIATION. Fifth annual convention, Roanoke, Va. Secretary, H. G. Otis, city manager, Auburn, Me.

Nov. 12-16.—NATIONAL TAX ASSOCIATION. Annual conference, St. Louis, Mo. Secretary, Fred R. Fairchild, Yale University, New Haven, Conn.

Nov. 14-15.—WASHINGTON STATE GOOD ROADS ASSOCIATION. Annual convention, Pasco, Wash. Secretary, Clancey M. Lewis, Seattle, Wash.

Nov. 14-16.—ASSOCIATION OF URBAN UNIVERSITIES. Annual convention, Boston, Mass. Secretary, Frederick B. Robinson, College of the City of New York, N. Y. C.

Nov. 26-28.—UNION OF MANITOBA MUNICIPALITIES. Annual convention, Winnipeg, Man. Secretary, Robert Forke, Pipestone, Man.

Dec. 3-6.—AMERICAN SOCIETY OF MECHANICAL ENGINEERS. Annual meeting, New York, N. Y. Secretary, 29 West 39th St., New York City.

American Public Health Association.

The influenza epidemic has caused the postponement to December 9-12 of the annual meeting of the American Public Health Association, which was to have been held October 14-17. A good attendance was assured from the upper Mississippi Valley, where influenza had not yet become generally epidemic. However, at the urgent request of the Surgeon General of the U. S. Public Health Service and of many eastern speakers and delegates, the later date was set, it being judged unwise to take sanitarians from their posts at this time.

Further announcement will be issued by the association at Boston.

American Society of Mechanical Engineers.

The Council of the American Society of Mechanical Engineers will meet in Indianapolis, Ind., on October 25 and 26. In connection with this an elaborate meeting of the Indianapolis, Cincinnati, St. Louis, Chicago, Milwaukee, Detroit and Cleveland sections has been arranged. The Indiana Engineering Society, the Indianapolis-Lafayette Section of the American Institute of Electrical Engineers and the Indianapolis Section of the American Society of Automotive Engineers have also been invited.

The headquarters of the meeting will be the Claypool Hotel, where also the two professional sessions scheduled and the committee meetings will be held. The preliminary program calls for a meeting of the council on Friday morning and a meeting of the committee on local sections and members

of the executive committees of the mid-western sections. At noon, at an informal luncheon, the mayor of Indianapolis is expected to welcome the visitors.

On Friday afternoon there will be a symposium on fuel conservation: "An Explanation of the Regulations of the Fuel Administration," by Dr. P. B. Noyes, director of coal conservation, United States Fuel Administration; "What the Fuel Administration Expects of the Engineers," by David Moffat Myers, advisory engineer, United States Fuel Administration, followed by discussion, in which the administrative engineers of the Fuel Administration and members of the society will participate.

An informal dinner, at which nominee for president, M. E. Cooley, is expected to speak, followed by war pictures, is arranged for the evening.

Saturday morning's program is as follows: Symposium on research; opening address by Professor Walter Rautenstrauch, member of the society's committee on research; address by Dr. W. J. Lester, vice-chairman of the Mechanical Engineering Division of the National Research Council; discussion by members of the society; exhibition of the Liberty motor.

An informal luncheon at place arranged by the local committee is scheduled for Saturday noon.

For Saturday afternoon the committee is arranging a visit to Fort Benjamin Harrison, at which a large detachment of United States Army engineers are stationed, and also for visits to several prominent Indianapolis clubs.

PERSONALS

Bennett, Frank L., commissioner of public works of Chicago, has resigned to become commissioner of public works for the State of Illinois, having been appointed by the Governor.

Boulay, Louis A., sanitary engineer of Lucas County, Ohio, is now captain in the Engineer Officers' Reserve Corps. R. E. Harrison has been appointed acting sanitary engineer to succeed him.

Jones, Oliver T., formerly city clerk of Pittsburg, Kans., for a number of years, has been elected mayor succeeding W. W. Bell.

Poole, Arthur C., city engineer, and John F. Skinner, principal assistant city engineer of Rochester, N. Y., have been commissioned as captains in the Engineers Corps and the Construction Division, respectively.

Savage, H. N., who has represented the city of San Diego in the construction of the new dam at Lower Otay, has recently been given entire charge of the work, following the abrogation of the contract with James Kennedy by the city.

PROBLEMS CITIES ARE STUDYING WITH EXPERTS

Bethlehem, Pa., is to have a comprehensive CITY PLAN prepared by the planning expert, Frank Koester.

Garretson, S. D., is to build WATERWORKS, using day labor, according to plans prepared by the consulting engineer, S. B. Howe.

Foard County, Crowell, Tex., is to make HIGHWAY IMPROVEMENTS according to plans and specifications prepared by the consulting engineering firm of Hess & Skinner.

WATER IMPROVEMENTS are to be made in Cameron County, Santa Maria, Tex., including canals, laterals, ditches, gates, pipe lines, bridges, etc. The engineer for the work is A. E. Anderson.

A FILTRATION PLANT to cost about \$500,000 is proposed for Wheeling, W. Va. Plans for the improvement are in process of preparation by the consulting engineering firm of Chester & Fleming.

Pulaski County, Little Rock, Ark., is to build a \$550,000 reinforced concrete BRIDGE across the Arkansas River. Plans for the structure were prepared by the consulting engineering firm of Hedrick & Hedrick.

Hostetter Drainage District, Covington, Ill., is to make DRAINAGE IMPROVEMENTS planned by the engineer, F. E. Bishop.

Bonds have been voted for the improvement of the WATERWORKS and ELECTRIC LIGHT SYSTEM of Peru, Kan. Plans for the work have been completed by the consulting engineering firm of Archer & Stevens.

WATERWORKS IMPROVEMENTS, including reinforced concrete reservoir and mains, are to be built by Minot, N. D. Plans and specifications for the improvement were prepared by the consulting engineer, Frederick Bass.

Ft. Scott, Kans., is to make WATERWORKS IMPROVEMENTS to cost over \$155,000, including impounding dams and a filtration plant. The consulting engineering firm of Black & Veatch is preparing plans for the work.

Following a request by the Northern Ohio Traction and Light Company for an INCREASED FARE of six cents in Akron, O., the city is studying the operating situation of the company. The consulting firm of Hagenah & Erickson has been retained to make an investigation and report.

NEW APPLIANCES

Describing New Machinery, Apparatus, Materials and Methods and Recent Interesting Installations.

CHAIN GRATE STOKER.

For Higher Volatile Coals—Efficiency and Flexibility.

The efficiency of a power plant depends, of course, on the effective burning of coal, and the vital factors in this are complete utilization of fuel and speed. The former is always necessary, but in the case of speed operating conditions frequently necessitate a wide range, so that flexibility of service and ability to make a ready response to peak and over-rating demands are essential. In the case of waterworks, for instance, a fire alarm will require an immediate boost in pressure, and this may occur at a time, such as a hot summer afternoon, when consumption is already at peak. A power plant which fails to deliver at such a time may naturally be the cause of serious loss.

Capacity, flexibility and efficient burning are the objects of the design of the Laclede-Christy chain grate stoker, which burns higher volatile coals. The principle of the stoker is, of course, making the grate of the furnace a continuous chain conveyor. The ability to burn coal at high rates is due to four essential features in the design and operation of the stoker and furnace: Quick ignition; generous, continuously clean air openings; low resistance of a fire, and fuel bed activity.

The hipped arch construction and vertical bridge wall concentrate the heat of the furnace full on the incom-

ing coal. The heat is driven through the bed of fuel quickly, starting a prompt burning of every particle and maintaining the intense fuel bed temperatures over the entire grate area.

The air openings are so numerous and so designed that a much larger opening area is obtained than is usual, with a consequent increase in air provision, and therefore in rate of burning.

The amount of air passing through these openings and the thin, clean fuel bed under the influence of the draft power of the high chimney is claimed to be fully equivalent to the amount that would be furnished by a powerful blower, the energy of which is spent against higher tuyere resistance and a heavy fuel bed. The need of fan installation, with its cost and upkeep charges, is thus eliminated. The thin bed is clean and burns without clinker. The bed is of measured positive depth, uniformly spread and without high spots and thin ones, holes or black spots.

The brisk burning of the incoming fuel, driven to great activity by the arch and furnace construction, is rapidly accelerated under the concentrating influence of the furnace until near the bridge wall fuel is burned at rates exceeding 100 pounds per square foot of grate surface per hour. This rapid and complete burning results in the high capacity.

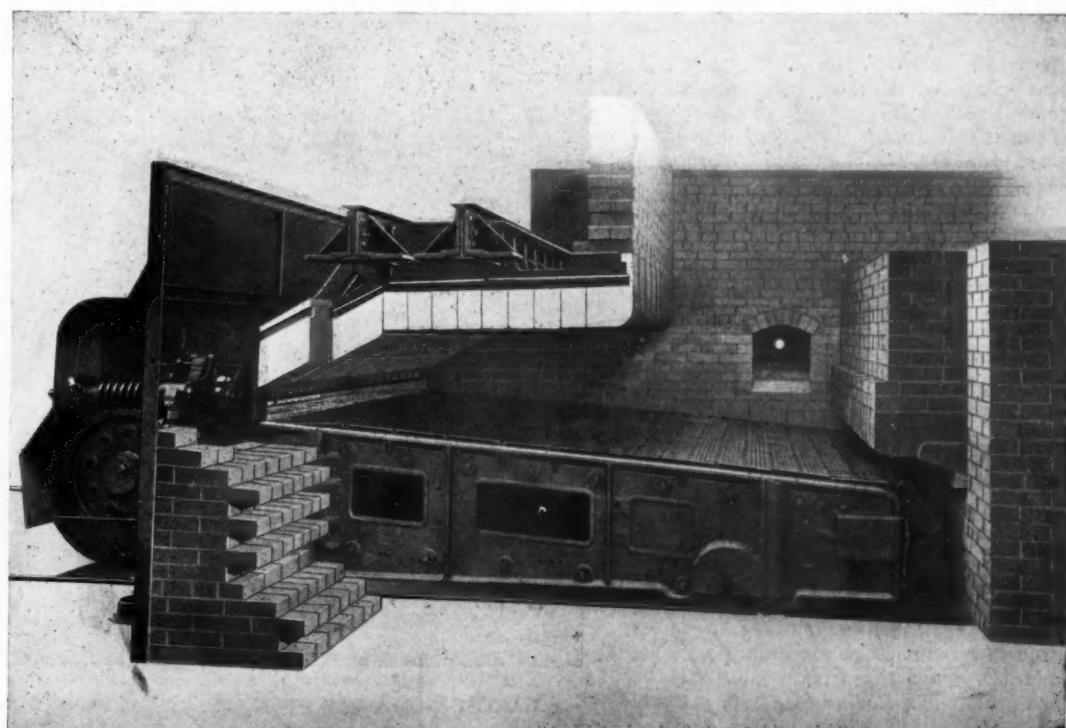
Sudden increases in capacity mean increasing the rate of burning of the

coal already in the furnace and faster feeding. The relatively thin fuel bed has no thick piles of green coal requiring conditioning. It is claimed that if the amount of coal in the Laclede-Christy chain grate fire could be burned in three minutes the heat developed would drive the boiler at 1,000 per cent of rating. Flexibility is therefore a matter of reserve chimney draft because the incandescent fuel bed is always ready to be whipped into faster action by merely opening the stack damper and giving the fire more oxygen under more intense and sharper draft. This increased rate of burning is followed by an increase in stoker speed.

The design of the stoker and its parts are absolutely standardized. All parts are of exceptionally heavy construction and accurately made. The active grate surface is constructed on a decided incline. It is made up of self-cleaning links, with generous air openings and an abundance of cooling and ventilating surface. The drippage or fine coal which sifts through the grate is reduced to a minimum, not exceeding 3 per cent. of the coal fired. Every link is of one design and pattern. Cast-iron rollers are threaded on the chain rods, and these rollers are placed between links so that no two links touch, resulting in flexibility. The driving sprockets bear directly to the chain rods through rollers without exciting undue strain on any so-called right and left driving links. Because of the uniform link design, the close-

LACLEDE-
CHRISTY
CHAIN GRATE
STOKER
FOR HIGHER
VOLATILE
COALS.

(Showing structure
of grate and hipped
arch construction and
vertical bridge wall
of furnace.)



ness of the driving sprockets and the large diameter of the chain rods, each link carries its share of the tension of the drive. The adjustment of the chain tension is made at the front of the stoker so that it is accessible at all times, and renewals of links may be accomplished without interference in operation.

The Laclede-Christy furnace which surrounds the stoker is unusually simple in design and construction, and no iron work is used. When the stoker is rolled from its setting, only a furnace of highly refractory materials, without plates or other metal, is left.

The operation of the stoker is automatic and positive, and only three features permit of adjustment. The thickness of the fuel bed may be altered by changing the position of the feed gate. The load conditions and character of fuel determines this thickness, and the position of the gate is fixed by the head firemen or plant engineer, and seldom altered except when changing to a different grade of fuel or in banking. The position of the stack damper is changed to meet the varying calls for steam. The speed of the moving grate is regulated solely to keep an active fire well up to the bridge wall. Cleaning is automatic and requires no attention.

Economy of operation is the result of a number of valuable features. All the heat possible is used. The furnace concentrates intense heat on the incoming coal so that the liberated gases representing nearly 50 per cent of the heat value of the coal leave the bed with an intense activity. Combustion is continued during the travel under the characteristic long arch. The sharp right-angle turn at the end of the arch acts as a gas mixer, and after this right-angle turn is made combustion is completed in the vertical combustion space. Clean burning cuts out waste of combustible in the ash. Another economy is the absence of overhead expense on a big forced-draft fan installation. No power is needed for dump plates because of automatic cleaning. Maintenance economy is aided by the absence of unnecessary metal parts exposed to heat, the grate links being exposed only intermittently and made to last during the life of the plant. "Star laborers" are unnecessary because the efficiency is built into the stoker and is not dependent on the high training of attendants.

One of the best installations in the country is that at the St. Louis water-works. The Chain of Rocks pumping station has saved thousands of dollars in operation, and the city has recently installed another battery of eight large Laclede-Christy stokers at the Baden pumping station. Another example of efficient operation is furnished by the Indianapolis Water Company. Here the city requires an increase of water pressure from 60 to 100 pounds in six minutes from the first stroke of the fire gong. The Laclede-Christy stokers

have made records during emergencies under severe conditions.

The accompanying illustrations show a view of the stoker in its setting and one of a battery of eight stokers in the boiler room of the Indianapolis Water Company, Riverside station. The equipment is made by the Laclede-Christy Clay Products Company, St. Louis, Mo.

INDUSTRIAL NEWS

Cast Iron Pipe.—High record output of pig iron and a marked tendency on the part of government officials to divert iron from the pipe makers are the latest developments following the recent price raises. Pig iron was produced in September at 113,942 tons a day, the highest rate in the history of the industry, representing a gain of 4,600 tons a day over that of August. However, new requirements from France mean the further concentration of mill operations on rails, shell steel, barbed wire and steel for cars. The orders of the Allies have materially increased. Some rearrangement of priorities may be necessary, in view of the more acute situation developed this week.

Cast-iron pipe manufacturers have spent several days in Washington conferring on needs of the government and on ways and means of getting pig iron, the disposition of officials being to give this industry very little iron. The further concentration of blast furnaces on steel making iron is part of the government plan. But it is hoped that the newly created committee of cast-iron pipe manufacturers which will cooperate with the War Industries Board will be able to figure

out a satisfactory basis of operations so that no plants will be compelled to suspend. Quotations: Chicago: 4-inch, \$69.80; 6-inch and larger, \$66.80; Class A, \$1 extra. New York: 4-inch, \$70.70; 6-inch and larger, \$67.70; Class A, \$1 extra.

H. W. Clark Co., Mattoon, Ill., which manufactures the Clark Meter Box and a comprehensive line of water works appliances, is now rebuilding its big factory which was totally destroyed by a tornado last year. Since that time it has been operating in cramped temporary quarters under trying conditions, but it has succeeded in caring for its trade and making shipments regularly. The plant is being rebuilt on the old site in Mattoon, a part of the foundations and some of the building material being utilized. The new plant will be of modern, substantial construction, of brick, stone, concrete and steel, with steel sash daylighting throughout. The plant layout is the result of particular attention to the most efficient routing.

The equipment will be modern and complete in every respect. The entire big molding floor will be supplied with electrically driven overhead trolley conveyors for handling the molten metal and the rough castings from the sand. The yard and the rest of the plant will be equipped with overhead trolleys and industrial tracks. The charging floor of the cupola will be of steel and reinforced concrete, the fire-proof feature being emphasized throughout. New patterns and flasks, special molding machines and machine shop equipment will be installed.

It is expected that the new plant will be completed within a few weeks, the walls being already up.



LACLEDE-CHRISTY STOKERS AT INDIANAPOLIS WATER CO. PLANT.

ADVANCE CONTRACT NEWS

ADVANCE INFORMATION BIDS ASKED FOR

CONTRACTS AWARDED ITEMIZED PRICES

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we cannot guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also correction of any errors discovered.

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREETS AND ROADS.				
Ill., Paris		Oct. 19..	Construction of gravel roads in Bruilets Creek Twp., Edgar county	Karl J. Barr, Co. Supt. of Highways.
Minn., Caledonia		noon, Oct. 19..	Clearing, grubbing and grading road.....	E. N. Newhouse, Co. Aud.
Neb., Bayard		noon, Oct. 20..	Sidewalks on four alleys and six crossings.....	City Engineer.
O., West Park		Oct. 21..	Construction of stone or cement sidewalks.....	Village Engineer.
Wis., Beloit		2 p.m., Oct. 21..	Grading avenue	Wm. K. McGill, Comr. of Pub. Works.
O., Akron		Oct. 21..	Brick pavement	State Hwy. Comn., Columbus.
O., Akron		Oct. 21..	Paving 14,861 sq. yds., including 5-in. concrete base and 26,675 sq. ft. 4-in. cement sidewalk, 7,631 ft. stone and 3,266 marginal curbing.....	E. A. Zeisloft, Engr., Dela- ware Bldg.
Utah, Ogden		2 p.m., Oct. 22..	Improving about 6 mi. of national forest road, involving 5,564 cu. yds. rock and 22,418 cu. yds. common excava- tion; concrete, dry rubble masonry and riprap.....	B. J. Finch, Dist. Engr., Bu- reau of Pub. Roads, 403 Hud- son Bldg., Ogden, Utah
N. Y., Brooklyn		11 a.m., Oct. 23..	Regulating, grading, curbing, laying sidewalks and pav- ing with granite on 6-in. foundation, involving about 3,660 sq. ft. 6-in. cinder or gravel sidewalk foundation, 2,410 sq. yds. granite, with joint filler of tar, asphalt and sand	Edward Riegelmann, Pres. Borough of Brooklyn.
Ill., Logan		10 a.m., Oct. 23..	Constructing three gravel roads.....	Wm. Martin, Comr. of High- ways.
Ia., Davenport		noon, Oct. 24..	Construction of cement sidewalks.....	Temple & Burrows, 208 Main St.
Tenn., Jacksboro		Oct. 28..	Macadamizing 13 mi. of road.....	J. A. Cooper, Co. Secy.
Minn., Ada		2 p.m., Oct. 26..	Excavation of 17,350 cu. yds., one reinforced concrete culvert, 1 mile road leveling and hauling gravel.....	D. E. Fulton, Co. Aud.
O., North College Hill		noon, Oct. 30..	Grading and macadamizing and laying drain pipes.....	L. C. Levoy, Village Clk.
Ind., Jeffersonville		10 a.m., Nov. 4..	Improvement of highway by grading, draining and pav- ing with macadam.....	Geo. W. Stoner, Co. Aud.
Tex., Houston		10 a.m., Nov 14..	Hauling and placing shell on road.....	H. L. Washburn, Co. Aud.
SEWERAGE.				
Neb., West Point		noon, Oct. 18..	Sanitary sewer, involving 470 ft. 8-in. clay tile.....	C. E. Mead, City Clk.
Ill., Walnut		1 p.m., Oct. 19..	Drainage construction involving 4,000 ft. 18-in., 3,000 ft. 16-in. and 4,260 ft. 15-in. drain tile.....	Harry Smith, Clk. Drainage Dist., Manlius, Ill.
Wis., Ashland		10 a.m., Oct. 22..	Constructing 8-in. sanitary sewer.....	W. C. Morris, City Clk.
O., Akron		Oct. 21..	Sewer construction, involving 1,675 ft. 6 to 24-in. tile, 3,570 ft. 30 to 54-in. brick sewer, 25 manholes, 40 inlets, 100 laterals and 6,000 cu. yds. trenching.....	E. A. Zeisloft, Engr., Dela- ware Bldg.
Ia., Creston		8 p.m., Oct. 21..	Constructing about 1,000 ft. 8-in. sanitary sewer.....	Theo. S. DeLay, City Engr.
N. Y., Brooklyn		11 a.m., Oct. 23..	Constructing sewer, involving 6 to 15-in. pipe.....	Edward Riegelmann, Pres. Boro. of Brooklyn.
Pa., Beaver Falls		7 p.m., Oct. 28..	Designing, engineering and other services in connection with extension of present outfall sewer, involving about 1 mile of 24-in. sewer.....	Harry T. Barker, City Engr.
S. D., Platte		8 p.m., Nov. 4..	Construction of a sewerage system and sewage disposal plant, consisting of approximately 6,100 ft. 15-in. sewer, 1,100 lin. ft. 12-in. sewer, 1,465 lin. ft. 10-in. sewer, 26,075 lin. ft. 8-in. sewer, together with the necessary appurtenances, septic tank, sludge bed and sand filter bed	C. F. Slate, City Auditor.
WATER SUPPLY.				
Mich., Detroit		2 p.m., Oct. 22..	Horizontal, motor-driven centrifugal pumping unit, hav- ing a capacity of 70,000 gal. per minute and horizontal, motor-driven centrifugal pumping unit having a ca- pacity of 45,000 gal. per minute and auxiliary equip- ment	H. S. Starkey, Secy. Bd. of Water Comrs.
Minn., Janesville		7 p.m., Oct. 23..	Installation and erection of a 2-stroke pump head, direct connected to a 20 hp. motor—220 volts, 60 cycle, 3-phase A.C. pump, capable of delivering 200 G.P.M. against a total head of 200 ft., drop pipe, 8-in. standard weight galvanized pipe	R. R. Brown, Vil. Recorder.
Okl., Ponca City		2 p.m., Oct. 23..	Furnishing and erecting complete steam engine direct- connected to approximately 475 K.V.A. generator; fur- nishing and erecting complete condenser equipment for above unit, including spray pond equipment; furnishing and erecting one 500 HP. heater without metering de- vice; purchasing from the city one 75 K.W. and one 100 K.W. direct-connected unit now operating in the above plant	Burns & McDonnell, Engrs. Interstate Bldg., Kansas City, Mo.

BIDS ASKED FOR

STATE	CITY	RECD UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
LIGHTING AND POWER.				
N. Y., New York	10:30 a.m., Oct. 21.	Repairing and altering boiler plant at Blackwell's Island	Bird S. Coler, Comr. of Pub. Char.	
Minn., St. Paul	10:30 a.m., Oct. 21.	Furnishing lighting globes	H. W. Austin, Pur. Agent.	
Okla., Ponca City	2 p.m., Oct. 23.	Construction of water and lighting plant	Burns & McDonnell, Engrs., Interstate Bldg., Kansas City, Mo.	
Tenn., Memphis	11 a.m., Oct. 24.	Furnishing turbines, pump set, feed water heater, electric light plant and boilers for hydraulic grader (specification 1820)	Mississippi River Commission, Custom House	
N. Y., Utica	3 p.m., Oct. 30.	Reconstruction of boiler room (boilers and changes to central heating plant), at the Utica State Hospital	Lewis F. Pilcher, State Arch., Capitol, Albany, N. Y.	
N. J., Maplewood	8 p.m., Nov. 6.	Furnishing about 500 ft. single-jacket 2½-in. rubber fire hose	Edward R. Arcularius, Township Clerk.	

FIRE EQUIPMENT.

O., Youngstown	Oct. 21.	Furnishing one motor-driven triple combination pump and hose cart with a capacity of not less than 750 gal., together with the necessary tools and equipment	Dept. of Public Safety.
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BRIDGES.

N. D., New Leipzig	10 a.m., Oct. 18.	Bridge filling for fourteen bridges	Robert D. Beery, Co. Auditor.
O., Cleveland	11 a.m., Oct. 19.	Bridge work, involving piling and grading	W. A. Stinchcomb, Co. Surv.
Ind., Crown Point	10 a.m., Oct. 19.	Construction of bridges and reinforced concrete slab culverts	Geo. M. Foland, Co. Surv.
Ill., Rockford	Oct. 21.	Constructing bridge	A. R. Carter, County Supt. of Highways.
Tex., Houston	10 a.m., Oct. 21.	Painting and scraping bridge over San Jacinto River	County Engineer.
O., Columbus	2 p.m., Oct. 22.	Construction of concrete retaining wall and repairing viaduct	Henry Maetzel, City Engr.
N. J., New Brunswick	Oct. 24.	Constructing Strauss trunnion bascule draw span and concrete encased girder approach spans	A. B. Fox, Co. Engr., Perth Amboy.
O., Cincinnati	noon, Oct. 25.	Renewing floor of bridge	County Surveyor.
N. D., Hettinger	Oct. 26.	Construction of six bridges	H. J. Stricken, Co. Aud.

MISCELLANEOUS.

Minn., Duluth	11 a.m., Oct. 21.	One 3-ton truck	W. H. Borgen, Clerk.
O., Columbus	noon, Oct. 22.	Constructing concrete masonry retaining wall	Geo. A. Borden, Dir. of Pub. Service.
N. Y., Albany	3 p.m., Oct. 24.	Constructing, heating, plumbing and drainage and electric work on state armory at Troy	Lewis F. Pilcher, State Archt.
N. Y., Tompkinsville	Oct. 27.	Furnishing 4,300 galvanized iron elbows	Lighthouse Inspector, 3d Dist.
Tex., Santa Maria	2 p.m., Oct. 28.	Construction of 65,000 cu. yds., more or less, of canals, laterals and ditches and for construction of certain gates, pipe lines, bridges, etc.	A. E. Anderson, Engineer, Brownsville, Tex.
N. Y., Buffalo	11 a.m., Oct. 28.	Dredging and rock excavation	U. S. Engr. Office, Buffalo
Minn., Windom	2 p.m., Oct. 29.	Construction of county ditches, involving 8 to 16-in. tile and retaining walls	S. A. Brown, Co. Aud.
Neb., Mitchell	2 p.m., Nov. 2.	Construction of 13.1 miles of main canal, involving about 550,290 cu. yds. of excavation	U. S. Reclamation Service, Washington, D. C.
S. D., Platte	8 p.m., Nov. 4.	Constructing sewerage system and sewage disposal plant, involving about 6,100 ft. 15-in., 1,100 ft. 12-in., 1,465 ft. 10-in., and 26,075 ft. 8-in. sewer, together with necessary appurtenances; septic tank, sludge bed and sand filter bed	Street Committee.
Va., Bristol	4 p.m., Nov. 11.	Cleaning out channel and bed of creek, removing approximately 3,000 cu. yds. of material	C. F. Slate, City Auditor.
Port Rico, San Juan	10 a.m., Nov. 25.	Construction and installation of garbage and refuse in-Bur. of Insular Affairs, War Dept., Washington, D. C.	Dept. of War, Washington, D. C.

ROADS AND STREETS

Blytheville, Ark.—About Dec. 1, bids will be received for paving 20 blocks; \$150,000 in bonds sold.

Jacksonville, Tex.—Construction of a road between this city and Baldwin, to cost about \$40,000, is considered by the state highway commission, Tallahassee.

Kirkwood, Ill.—Street improvement bonds, \$10,000, voted at a recent election, was purchased by local banks.

Fort Wayne, Ind.—The following street improvements are considered: Widening of Meridian St. north of Hoffman; cement sidewalk South Monroe from Boett to Helen St. and on Eliza St. from Division to Chute; for the vacation of Canal St. south right-of-way line of the N. Y. C. & St. L. Ry., widening of Cochran St. from Coomb to Canal St., new sewer north of Elizabeth from alley east of Clinton St. from Elizabeth to alley between North Barr and North Lafayette Sts., and for alley north of Elizabeth to Kamm St. Board public works.

Courtland, Kan.—City plans to pave various streets. Black & Veatch, Inter-

state Bldg., Kansas City, Mo., engineer.

Lansing, Mich.—Superintendent of public works directed to gravel Clemens Ave. from Michigan Ave. to Saginaw St.; also Fayette St. from Ada St. to Pennsylvania Ave., Beulah St. from M. C. R. R. right of way to Fayette St., Ada St. from Baker St. to Beulah St., and Kohler court from Meech St. to M. C. R. R. right of way. J. W. Ferle, mayor.

Pontiac, Mich.—Not satisfied with having tied up the concrete roads of West Bloomfield township by a suit challenging the Covert law's constitutionality, residents of that district have now appealed to the courts to compel the county to gravel the road, which should have been paved.

Wadena, Minn.—For state roads following sums have been appropriated: State Road No. 1, Leaf River hill, \$1,500, west of railroad in Rockwood, \$1,500; State Road No. 2, Wadena twp., \$1,500; Aldrich twp., culvert, \$200; State Road No. 4, north of Verndale in Aldrich twp., \$3,500; North Germany twp., \$2,200; State Road No. 6, Orton twp., \$3,500; also two bridges, \$2,000; west of Sebeka, \$3,000; State Road No. 7, west of Menahga, \$1,000.

Great Falls, Mont.—The capital issues committee has refused to grant Cascade county the issuance of road improvement bonds, \$100,000. John E. Moran, county clerk.

Bayard, Neb.—City lets contract soon for sidewalks and four alleys and six crossings. Orin J. Lathrop, city clerk.

Elizabeth, N. J.—Union county's road program for next year has been prepared and sent to the state highway commission, where it will undergo scrutiny and be forwarded to Washington for government action. County Engineer Jacob L. Bauer has received estimates from all the municipalities for necessary work. Plans for new work have been omitted for the sake of economy. For reconstruction work the outlay proposed is \$40,000, which includes a sum for the reconstruction of St. George's Ave. in Rahway. For maintenance the sum of \$125,000 has been requested. The towns that ask permission to expend money on road construction are: Westfield, \$5,000; Hillside, \$2,000; Garwood, \$75,000, and Roselle, \$1,800. Those that seek reconstruction are: Summit, \$4,000; Plainfield, \$64,000; Scotch Plains, \$5,000, and Linden, \$1,500. Between \$250,000 and \$300,000 will be spent on maintaining roads not in the county highway system if requests are approved. Approval for maintenance is asked by the following: Elizabeth, \$35,000; Plainfield, \$35,000; Rahway, \$20,000; Westfield, \$85,000; Clark, \$1,000; Scotch Plains, \$5,000; Cranford, \$14,000; Linden, \$49,000; New Providence township, \$1,400; Springfield, \$2,137.56; Union, \$8,000; Kenilworth, \$1,000; Hillside, \$8,500; Roselle,

elle, \$1,200; Garwood \$500; Linden, \$3,000; Mountainside, \$1,500; New Providence Borough, \$2,000, and Roselle Park, \$8,000.

Long Island City, N. Y.—The board of estimate authorized President Connolly to enter into a contract for a sheet asphalt repavement in Fulton and Main Sts., from Stevens St. to Van Alst Ave., Long Island City, at an estimated cost of \$29,018.50.

St. George, N. Y.—For building concrete curb with steel guard, resetting bluestone curb, laying vitrified brick gutter on concrete foundation, relaying stone block gutter on concrete foundation on Elliott Ave., from Amboy road to Johnson Ave. C. D. Van Name, president, Richmond Boro., rejected all bids received Oct. 1; will readvertise.

Salamen, N. Y.—See "Sewerage."

Syracuse, N. Y.—Board of contract and supply rejected a bid for building sidewalks in Salt Springs road; will re-advertise.

Raleigh, N. C.—Committee from the Chamber of Commerce and Major Lang of the construction division of the Quartermaster's Corps, and Constructing Engineer Dougherty, for the government, were appointed to meet with the city and county commissioners and the State and Western Wake Highway Commissions to discuss the extension of the concrete road from the State Fair Grounds to the camp limits.

Alliance, O.—See "Water Supply."

Ashabula, O.—The capital issues committee has been asked to pass on the issuance of street improvement bonds, \$65,000.

Athens, O.—City will take bids Oct. 25 for \$1,700 Fern St. extension bonds. Clyde Edmundson, city auditor.

Canton, O.—The county contemplated paving the Massillon-Canal Foulton road with macadam or brick for 3 miles. J. L. Sickaffese, this city, engineer.

Cincinnati, O.—The commissioners and county surveyor of Butler county have agreed to pay have the cost of repairing the Howard road and the Edgewood School House road, all being near or on the Butler-Hamilton county line.

Cincinnati, O.—Commissioners of Hamilton county will view the condition of Sharon road between the Reading pike and Chester Ave., which the surveyor reported would take \$1,225 to put in passable condition. The surveyor was instructed to repair Baughman road No. 29 from Harrison and New Haven road to the Edgewood School House road, the estimated cost being about \$1,000. Bids were asked for the repair of Bridge No. 67 on the East Miami road. The estimated cost is \$1,200. Residents of Sharonsville petitioned for the improvement of the Dayton pike, from Sharonsville north to the Butler county line.

Cincinnati, O.—See "Bridges."

Cincinnati, O.—City council passed an ordinance for paving Chariot Ave. from Gamble Ave. to alley south of Gamble Ave., brick. John Galvin, mayor.

Chillicothe, O.—City has sold to the sinking fund trustees \$4,000 High St. improvement bonds. Robert T. Weaver, city auditor.

Cleveland, O.—The U. S. ordinance department asked county commissioner to construct a 1,900 ft. road to connect its Cleveland warehouse with Babbitt road.

Cleveland, O.—The capital issues committee has approved the city's plan for a \$200,000 bond issue for constructing a boulevard approach to the high level bridge.

Clyde, O.—Sandusky County Surveyor E. M. Millions was instructed by the state highway department to survey the section of the Maumee Pike between Fremont and Clyde and proceed to rebuild it. The stretch is section J of the Fremont-Bellevue road, 5.8 miles long, extending from the east corporation line of Fremont to the west corporation of Clyde.

Euclid, O.—The paving of Bobbitt road has been required of this village as a war emergency measure. F. A. Pease, Marshall Bldg., Cleveland, will prepare plans at once.

Lakewood, O.—The taxpayers will vote in November on the proposition to extend Franklin Ave. in two directions. First is the short extension of a half block from Coutant Ave. to Highland. This will connect Franklin Ave. through from the Cuyahoga River. To the westward it is proposed to extend the avenue from Wyandotte, its present westward terminal, to Warren road. The estimated cost is \$75,000.

Lancaster, O.—A council committee has recommended that a new street be opened between Fair Ave. and Park St., west of Forest Rose Ave., running north and south, said street to be 50 ft. wide.

Portsmouth, O.—County Engineer John Harper has surveyed a new road on Upper Turkey Creek. The road is to be built at once.

Tiffin, O.—Plans are drawn and bonds will soon be advertised for a \$38,000 road improvement on the Seitz road, in Eden township. This includes a gravel road 3.52 miles, retaining walls, culverts, draining and 2,100 ft. of tile. J. L. Oberlander, court house, city engineer.

West Point, O.—J. J. Hoyes, village clerk, opens bids soon for the construction of stone or cement sidewalks on both sides of Carrington and Bennington Ave. and Brown road in the village.

Ebensburg, Pa.—The directors of the Cambria County Good Roads Association have voted to support the campaign for the authorization of a bond issue of \$50,000,000 for road purposes to be put up to the voters of Pennsylvania at the coming election. H. M. James, secretary of the Associated Highways Organizations of Pennsylvania.

Farrell, Pa.—See "Sewerage."

McComick, S. C.—John L. Kennedy, secretary highway commission, receiving sealed proposals Oct. 25 for the purchase of \$85,000 highway coupon bonds.

Jacksboro, Tenn.—Comms. Campbell county receiving bids later part of the month for macadamizing 13 mi. Pike road, between La Follette and Jeillico. J. T. Cooper, Secy.

Quantico, Va.—U. S. Govt. soon to let contract for grading road at this place.

Everett, Wash.—City council passed a resolution of intention to improve Nassau St. from the north line of Hewitt Ave. to California St. from Norton Ave. to Nassau with the necessary grading and concrete paving.

Olympia, Wash.—Approval of the state highway commission has been given to the completion of a contract for surfacing 19 mi. of the Central Washington highway, between Ritzville and Sprague. Also for surfacing eight miles of P. H. No. 4, from Ritzville to the Adams county line.

Spokane, Wash.—City council authorized Purchasing Agent Charles Bogart to buy 400 tons of asphalt and two carloads of cement for the department of public works. The material will be used in the 14th Ave., Trent Ave. and Monroe St. bridge paving now under way.

Tacoma, Wash.—The city council has passed an ordinance providing for the improvement of South 40th St. from Bell St. to East "B" St. by laying a 5-ft. cement sidewalk; also by grading an approach to the alley between East "A" and East "B" Sts.

Beloit, Wis.—City receiving bids for grading Henry Ave. from Royce Ave. to River road.

BIDS RECEIVED AND CONTRACTS AWARDED.

(*Indicates Contracts Awarded.)

Fayetteville, Ark.—*E. A. Gillett, Springdale, Ark., paving 14,000 sq. yd. asphaltic or bituminous macadam pavement, 15,000 lin. ft. curb and gutter and 3,800 cu. yd. excavation in improvement district No. 1; about \$28,000. City council.

Los Angeles, Cal.—Standard Oil Co., 1727 North Spring St., at \$13.50 per ton, low bidder, furnishing 3,200 tons D grade calo asphaltum, f. o. b., Los Angeles.

Madera, Cal.—*H. Crummey, Hearst Bldg., San Francisco, Cal., for paving Sixth St., between B and H Sts., at \$37,599.

New Haven, Conn.—*C. W. Blakeslee Co., 58 Waverly St., for street paving and resurfacing, city council. F. L. Ford, engr., City Hall.

Chicago, Ill.—*Schmidt Construction Co., grading and paving with 7 ins. of portland cement concrete, surface coated with asphalt or coal tar and top dressed with $\frac{1}{4}$ inch of torpedo sand, the roadway of the alley between Cullom Ave., Berteau Ave., Greenview Ave. and North Ashland Ave. *Contracting & Material Co., constructing a concrete curb, grading and paving with vitrified paving brick on 1 inch of portland cement mortar and 6 ins. of portland cement concrete, joints filled with asphaltic filler, surface dressed with $\frac{1}{4}$ inch of sand,

alleys between E. 35th St., E. 37th St., Prairie Ave. and Forest Ave. *Schmidt Construction Co., adjusting sewer manholes, grading and paving with 7 ins. of portland cement concrete, surface coated with asphalt or coal tar and top dressed with $\frac{1}{4}$ in. of torpedo sand, the alleys between E. 42d Pl., East 43d St., Vincennes Ave. and Grand Blvd. *R. R. Anderson Co., grading and paving with 7 ins. of portland cement concrete, surface coated with asphalt or coal tar and top dressed with $\frac{1}{4}$ in. of torpedo sand, the roadway of the alley between E. 57th St., a line parallel with and 100 ft. north of the north line of E. 58th St., Drexel Ave. and Maryland Ave. *Central Paving Co., constructing a tile pipe sewer, with new brick manholes and a new brick catch basin complete, grading and paving with 7 ins. of portland cement concrete, surface coated with asphalt or coal tar and top dressed with $\frac{1}{4}$ in. of torpedo sand, the roadway of the alley between East 69th St., East 69th Pl., Harper Ave. and Dante Ave. *Schmidt Construction Co., grading and paving with 7 ins. of portland cement concrete, surface coated with asphalt or coal tar and top dressed with $\frac{1}{4}$ in. of torpedo sand, the roadway of the alley between West Jackson Blvd., West Van Buren St., South Whipple St. and South Albany Ave.; also roadway of the alley between Polk St., Arlington St., South Sacramento Blvd. and South Albany Ave. *Robert R. Anderson Co., grading and paving with 7 ins. of portland cement concrete surface coated with asphalt or coal tar and top dressed with $\frac{1}{4}$ inch of torpedo sand, the roadways of the alleys between West Jackson Blvd., West Van Buren St., South Whipple St. and South Albany Ave. *Schmidt Construction Co., grading and paving with 7 ins. of portland cement concrete, surface coated with asphalt or coal tar and top dressed with $\frac{1}{4}$ in. of torpedo sand, the roadway of the alley between Midway Park, West Lake St., North Waller Ave. and North Menard Ave. *R. F. Conway Co., adjusting sewer manholes and catch basins, constructing and connecting catch-basin inlets, constructing new brick catch basins complete, constructing a granite concrete combined curb and gutter on cinder, gravel or sand, grading and paving with asphalt on 6 ins. of portland cement concrete, swept with natural hydraulic cement, the roadway of North Hamlin Ave. from the south line of Armitage Ave. to the north line of Cortland St. Also adjusting sewer manholes and catch basins, constructing and connecting catch-basin inlets, constructing one new brick catch-basin complete, constructing a granite concrete combined curb and gutter on cinders, gravel or sand, grading and paving with asphalt on 6 ins. of portland cement concrete, swept with natural hydraulic cement, the east 15.6 ft. of the roadway of South Wood St. from the south line of the right of way of the Englewood Connecting Co. Railroad to the north line of W. 59th St., and also resetting curbstones on limestone blocks, grading and paving with vitrified paving brick on 1 in. of portland cement mortar and 6 ins. of portland cement concrete, joints filled with asphaltic filler, surface dressed with $\frac{1}{4}$ in. of sand, the east 15.6 ft. of the roadway of South Wood St. from the north line of W. 59th St. to the north curb line of W. 59th St. *John Tiritilli, drains in South Park Ave. between East 95th St. and East 99th St. *A. Frank Ranieri, drains in North Troy St. between West Grand Ave. and Chicago, Milwaukee & St. Paul R. R. *Di Vito & Till, drains in a system of streets as follows: W. 71st St. between South Wood St. and South Robey St., South Marshfield Ave. between W. 72d St. and W. 74th St., South Pauline St. between W. 73d St. and West 74th St., South Hermitage Ave. between W. 72d St. and W. 74th St.; South Wood St. between W. 72d St. and West 74th St., South Honore St. between W. 71st St. and W. 74th St., South Lincoln St. between W. 71st St. and West 74th St., and South Winchester Ave. between W. 71st St. and West 74th St. Board of local improvements, Oct. 9. Michael J. Faherty, president. Edward J. Glackin, secretary.

Decatur, Ill.—*William Miller, for \$1.30 a cu. yd. for graveling the approach to the Stevens Creek bridge; also for graveling the road from the Sharon church to the Elliott corner, to *William Wilson, for \$1.50 a cu. yd. Highway Commissioner A. J. Conover.

Terre Haute, Ind.—*Carpenter Constr. Co., Trust Bldg., grading $\frac{1}{2}$ mile N. 13th St., 36 ft. wide, brick wearing surface, concrete foundation, and installing sewer and water laterals \$29,700. Work involves 4,600 cu. yds. grading and 300,000 sq. yds. brick block. Board public wks.

Taunton, Mass.—*Chas. T. Alger, 14 W. Britannica St., for pavement, city council.

Great Lakes, Ill.—*J. A. Sackley Co., 133 W. Washington St., Chicago, Ill., at \$72,700, building road, U. S. Govt., C. W. Parks, chief, bureau yards and docks, Navy Dept., Washington, D. C.

Louisville, Ky.—*Louisville Asphalt Co., Floyd and Lee Sts., at \$16,755, for removing old granite pavement on Market St., from 5th to 6th St., 480 ft. long, 60 ft. wide, involving 3,250 sq. yd. wood block, 1,100 cu. yd. old bed earth excavation, excavating to 10 1/4 in. sub grade, 1/4 in. sand and cement cushion over concrete base under wooden block, 3,250 sq. yd. 6 in. concrete base, etc.; *Bickel Asphalt Paving Co., 6th and Lee Sts., at \$12,692, Bway, from 10th to 11th Sts., 480 ft. long, 70 ft. wide, involving 215 sq. yd. vitrified brick gutters, 165 sq. yd. granite block stringers, 3,515 sq. yd. asphalt, \$1,200 cu. yd. old pavement excavation to 9 in. subgrade, 3,895 sq. yd. 6-in. concrete base, etc.

Ford, Mich.—*Rice Construction Co., Wyandotte, Mich., at \$8,000, for paving village council. Mason L. Brown & Son, engrs., 821 Chamber of Commerce Bldg., Detroit, Mich.

Lake Linden, Mich.—*Hicks Engr. Co., Vulcan, Mich., for 6 miles penetration tar and rock road in Lake Linden, Houghton county, highway commissioners, Mr. Coon, chairman, Sheldon Bldg., Houghton, Mich.

Great Falls, Mont.—*F. Elliott, Great Falls, at \$16,483, for building 3 1/2 miles Red road, 16 ft. wide, from city limits to Sand Contess, standard gravel roadbed, with 5-in. gravel and 2-in. sand, Cascade county.

Kansas City, Mo.—*J. E. Walsh, 1122 East Gillham road, paving 31st St. from Penn to Wyandotte St., brick, \$4 per yd.; concrete, \$1.89 per yd.; macadam, \$1.50 per yd., and 4-in. tile, \$1.15 per yd., about \$17,000. Board park commissioners.

Omaha, Neb.—*Condon & Bolan, for grading 23,500 cu. yds. road No. 41, known as Leavensworth St. road. Commissioners Douglas Co.

New York, N. Y.—Uvalde Asphalt Paving Co., 1 Broadway, at \$19,883; Sicilian Paving Co., 41 Park Row, \$20,280; Asphalt Constr. Co., 2197 Madison Ave., \$20,383, low bidders for widening, regulating and repaving 33d St., from 6th to 7th Ave.; sheet asphalt on concrete foundation. Work involves 3,030 sq. yd. asphalt on 6-in. concrete base, 20 ft. new granite curbing, 1,500 sq. ft. concrete sidewalks, etc. F. L. Dowley, president, Manhattan Boro.

Staten Island, N. Y.—*J. Johnson Sons, 455 Broadway, West New Brighton, at \$38,236, for repaving Vanduzer St., from Richmond turnpike to Wright St., excepting Hannan to Ware Sts.; also from point 150 ft. south of Broad St. to Vanderbilt Ave.; asphalt block. C. D. Van Name, president, Richmond Boro.

Syracuse, N. Y.—*Christina Ross, for \$377, for sidewalks in East Water St. Board of contract and supply.

Columbus, O.—*H. Streicher & Co., Toledo, \$48,963, grading and paving section B-1 of Tiffin-Fostoria road, Seneca Co. *Highway Construction Co., Elvira, \$28,968, grading and paving section P of Lima-Sandusky road, Seneca Co. State highway commission.

Marietta, O.—*Joseph Barnett, Fleming, O., for 1 mile dirt road and grading in Henry Erb road, commissioners of Washington county, W. P. Mason, engr., Court House, Marietta.

Youngstown, O.—*L. W. Russell, West Austintown, O., for paving in Coitsville township, at \$24,641, Mahoning county. E. S. Smith, engr., Court House.

Carnegie, Pa.—*S. Gamble Co., Oliver Bldg., Pittsburgh, for paving Campbell's road, from 7th Ave. to borough line; Chestnut St., from Ridge Ave. to borough line, and Summit St., from Chestnut St. to Grandview Ave. Boro. council.

Philadelphia, Pa.—Average unit low bids, total amount of all low bids \$55,280.79. Schedule "A" asphalt paving, total amount of low bids \$33,703.79. Asphalt paving (including 6-in. concrete base, \$3.69 per sq. yd. aver. price of; vitrified block gutter paving (including 6-in. concrete base, \$4.86 per sq. yd. Low bidder: Barber asphalt Paving Co., 239 N. 30th St. Schedule "B," furnishing and laying rubble gutters, total amount of low bid, \$4,125, rubble gutters, including 3-in. gravel base), average price of \$2.25 per sq. yd. Low bidder: J. J. McHugh, 1430 S. Penn Sq. Schedule "C," repairing and painting bridges, total amount of low bids, \$17,452. Low bidder: Mundy Paving & Construction Co., 228-30 S. Alder St. George E. Datesman, Dir., Dept. of Public Works. Fred C. Dunlap, Chief, Bureau of Highways.

Highmore, S. D.—*F. C. Cloeter, Highmore, S. D., for grading approaches to bridge in Peno township over Elm Creek. L. W. Carter, county auditor.

Nashville, Tenn.—For building federal aid roads, State Highway Commission, 327 7th Ave., N. Nashville, rejected bids. Work will be done by day labor, under supervision of state highway engineers, as follows: 10.89 mi., Franklin county, 12.27 mi., Bedford county; 2.64 mi., Moore and Greene counties; about \$130,000.

Falfurrias, Tex.—*W. T. Hutto, for Hutto, for building 20 mi. Falfurrias-Escino road, including bridges; about \$55,000. Brooks county.

San Antonio, Tex.—*Uvalde Rock Asphalt Co., Swearingen-McGraw Bldg., \$15,323; *McGill Constr. Co., 807 Gunter Bldg., \$3,847; *Texas Bitulithic Co., 705 Gunter Bldg., \$1,496, for repairing various streets with wood block. City council.

Janesville, Wis.—*Peter Garry, Evansville, Wis., for road, 2 1/2 miles, town of Union.

Sheboygan, Wis.—*John Braun, for grading 7,000 yds., by Peter Reiss. Jerry Donohue, engineer.

SEWERAGE AND SANITATION

Dubuque, Ia.—City soon lets contract installing 570 ft. 8-in. tile pipe sewer in Seminary St. John Stuber, city recorder.

Fort Wayne, Ind.—See "Streets and Roads."

Jackson, Miss.—A bond issue of \$90,000 for sewerage improvements will be voted on at Nov. 5 election.

Salamanca, N. Y.—H. A. Kahler & Co., New York, were awarded the following bonds: \$22,830 sewer, \$9,285 highway improvements, \$7,845 highway improvements.

Troy, N. Y.—The construction of two sewers to serve the dwellings about to be built by the government in Thompson and Quedar parks, was ordered.

Watertown, N. Y.—Contract soon let for sewers, \$5,000, Katherine, Seymour and Grant St. Isaac R. Breen, mayor.

Akron, O.—For furnishing materials and building sewers in Cuyahoga and Tallmadge Sts., city soon lets contract. Work involves 1,675 lin. ft. 6 24-in. tile sewers, 3,570 lin. ft. 30-54 in. brick sewer, 25 manholes, 40 inlets, 100 laterals and 6,000 cu. yd. excavating, trenching. H. S. Morse, director public service. E. A. Zeisloff, city engineer.

Akron, O.—Council authorized the issuance of \$12,000 in bonds to pay for the repair of the sewer in South Akron, near the Wellman-Seaver-Morgan plant.

Cincinnati, O.—City council passed ordinance to install sewer, Rulison, Coronado, Zula, Loretta Aves. John Galvin, mayor.

Dayton, O.—A bill will probably be introduced at the next session of the legislature to abandon the section of the canal passing through the city. Provided the waterway is abandoned the city will be in a position to submit a bond issue of \$250,000 to the electors for the construction of sewers along the canal course, and the boulevarding of the strip. Providing the legislature does not decide to abandon the canal a move will probably be started to have the canal improved. It could be placed in a sanitary condition for about \$25,000.

Lakewood, O.—City Engineer E. A. Fisher recently submitted to the city council plans for a main sewer extending from Rocky River along West Clifton Blvd., Clifton Blvd., and Webb road to the westerly end of the proposed Edgewater drive. The cost of the improvement is estimated at \$154,000. The depth of this sewer will be about 30 ft. at the northerly end and 95 ft. at the southerly end. It is designed to take care of sanitary sewage and convey it to the reduction plant in Rocky River valley. The engineer also submitted plans for a water main extending from Berea road along Fisher road to Warren road. The cost is estimated at \$41,500. This main will be of great assistance in relieving the water shortage south of West Madison Ave., and also will give needed fire protection.

Sandusky, O.—Construction of extensive sewer system at Mittawanga and Ruggles Beach considered by county commissioners.

Toledo, O.—A bond issue of \$50,000 to continue preliminary work on the city's intercepting sewer system authorized by the city council. An engineer will be engaged by the service department to prepare plans and specifications and estimates.

Platt, S. D.—For building sewerage system and sewage disposal plant, C. F. St., city auditor, lets contract in Nov. Involves about 6,100 lin. ft. 15, 1,100 lin. ft. 12, 1,465 lin. ft. 10 and 26,075 lin. ft. 8 in. sewer, together with necessary appurtenances.

Ambridge, Pa.—At the election on Nov. 5 the following bond issues will be submitted to the voters, \$50,000 funding and \$10,000 sewer.

Du Bois, Pa.—W. H. Albert, supt. of streets and public improvements, received no bids for 8-in. sewer in Fuller St., readvertise in the spring. F. C. North, engr.

Farrell, Pa.—Citizens at Nov. 5 election will vote on the proposition to issue the following bonds, \$52,000 for the construction of Haywood Hollow sewer and \$3,000 Broadway improvement.

Scranton, Pa.—City had plans drawn, sanitary sewer, Oakford Court and Walnut St. Wm. A. Shunk, engr., City Hall.

Ashland, Wis.—The city commission has rejected the bid which was submitted for the construction of sewers in the east end of the city.

Rosethern, Sask.—At an expenditure of about \$15,000 town council considers constructing a sewage disposal plant. R. S. Fleury, mayor.

BIDS RECEIVED AND CONTRACTS AWARDED.

(*Indicates Contracts Awarded.)

Los Angeles, Cal.—*Los Angeles Mfg. Co., 2500 Leonard St., for furnishing 10,000 ft. of 6-in. 14-gage riveted steel water pipe, 62 cents per ft. City council.

New Haven, Conn.—*Dwyer & Mannix, 27 Blake St., for sewers and appurtenances, city council. F. L. Ford, city engr.

Waterbury, Conn.—*L. Archambault, 11 Glen Ridge St., at \$3,837, for sewer and appurtenances in Hamilton Ave. City council. R. A. Cairns, engineer, City Hall.

Chicago, Ill.—*The Ryan Co., 4500 W. Division St., Chicago, for constructing pipe sewer with brick manholes and brick catch-basins from N. Nagle Ave. to Nettleton Ave.

Louisville, Ky.—*K. A. Barker, 1152 South 18th St., building sewer 2,305 ft. long in 41st St., from Walnut to Cedar St., and from Walnut to Shawnee parkway, involving 2,305 ft. 15-30 in. vitrified pipe and 100 lin. ft. excavation, etc., \$10,099; city furnishes tile and pipe, contractor only sand and cement for joints and manholes; building sewer 4,984 ft. long, in Ellison Ave., from Beargrass Creek to Fischer Ave., and Fischer and Rammers Ave., from Ellison to Danderidge Ave., involving 5,084 ft. segmental block and vitrified pipe, 150 cu. ft. excavation, \$40,176; city furnishes block or tile, contractor furnishes cement and sand for joints and brick for few manholes in pipe sewers. City council.

Louisville, Ky.—*J. A. Cahill, 1540 S. 9th St., building sewers in Hale Ave., from 25th to 26th St., then south to alley and east to 21st St., 3,741 ft. long, involving 2,741 ft. segmental tile block and vitrified pipe, 103 ft. excavation, \$13,771; city purchased tile and pipe and will furnish material.

Boston, Mass.—*Geo. J. Regan, 92 Stoughton St., Dorchester, Mass., at \$4,382.50, for sewerage works. *Wm. Barrett & Co., 35 Wendell St., sewers in Rutherford Ave., Charleston district. *Wm. J. Barry, 431 Ashland St., West Roxbury, Mass., at \$1,881, sewerage work in Freeport St., Dorchester district. Deparment public works.

Staten Island, N. Y.—J. Johnson & Sons, 455 Broadway, West New Brighton, \$38,813; J. E. Donawan, 2205 Richmond Terrace, Port Richmond, \$41,579, low bidders, building sanitary sewer with iron pipe outlet and necessary appurtenances in Richmond Terrace from Western Ave. to point 170 ft. east of Holland Ave. and from point 445 ft. west of Holland Ave. to pier and bulkhead line. C. D. Van Name, president, Richmond Boro.

Syracuse, N. Y.—*Antonio Ilaqua, the first section at \$12,275.75; *Samuel Palomino the second section at \$18,333, and the *Mondo Construction Co. the third section at \$4,972.50, for 17th ward sewer system, by board of contract and supply, Oct. 8.

Tonawanda, N. Y.—*J. M. Fahning, Buffalo, at \$22,074, building sewerage system in Broad, William and Minerva St.

Cuyahoga Falls, O.—*C. Wright, for sanitary sewers in Sackett St. and Bailey road. Work involves 7,500 cu. yds. earth excavation, 1,100 cu. yds. rock excavation, 7,900 lin. ft. 8-in. vitrified tile pipe, 21 brick manholes. Village council. W. H. Taylor, mayor. C. E. McKahan, engineer.

Lakewood, O.—*George Bros. for the sewer in Berea road for this city, and the village of West Park, \$33,015. City Engineer Fisher.

Troy, O.—*P. H. Sweeney, S. Mulberry Ct., for 275 ft. 6-in. sanitary sewer in Court St. City council. R. Hennessey, clerk.

Oklahoma, Okla.—See "Water Supply." **Clairton, Pa.**—*Mike Manella, Lang Ave., Pittsburgh, Pa., for sewer. Boro. council. H. M. Gates, clerk.

Duryea, Pa.—*Ben Paglianari, Old Forge, Pa., at \$1,047, for installing sewer 130 lin. ft. 18-in. t. c. pipe. Boro. council. E. H. Coward, engr., Miners Bank Bldg., Pittston, Pa.

De Pere, Wis.—*Jacob Farrell, for installing sewers. City council. C. G. Wilcox, mayor.

Sheboygan, Wis.—*Hans Sievers, at \$1,000, for sewers and water connections in Clara Ave. City council. C. N. Boley, City Hall.

WATER SUPPLY

Fayetteville, Ark.—City plans for about \$6,000 to install electric pump at White River pumping station.

Decatur, Ill.—A new steel water service station will be erected by the Chicago & Erie Ry. Co., with a capacity of 60,000 gals. Cost, \$12,000.

Shreveport, La.—Contract shortly let building four 16-in. Universal c.-i. pipe lines and pile trestle over Cross Bayou at pumping station. T. L. Aniss, supt. water works.

Detroit, Mich.—Negotiations are soon to be opened with the Detroit water board for extension of mains to the village of Ferndale. Engineer Geo. Jerome will give report on probable cost.

Shelby, Mont.—Water bonds to the amount of \$8,000 will be sold at public auction Nov. 6 by Town Clerk Lena Schroer.

Wildwood, N. J.—The Marine National Bank of Wildwood was the successful and only bidder for an issue \$35,000 water bonds, Oct. 3. Robert J. Kay, city treasurer.

Troy, N. Y.—Water board at the next meeting common council will report on the expenditure \$625,000 in the construction of the new water works. Mayor Joslin.

Alliance, O.—The following bonds have been authorized by the city council: \$11,000 water extension, \$11,500 street improvement.

Canton, O.—Ordinance for the issuance of \$39,000 bonds for extensions and general improvements in the water works division, and to issue \$26,000 in certificates of indebtedness. Funds to run service department, passed by city council.

Hamilton, O.—In connection with the building of 40 homes for workers by the Champion Mill, water works extensions are considered.

Huron, O.—See "Water Supply."

Piqua, O.—Plans have been drawn by Hazen, Whipple & Fuller, consulting engineers, 30 E. 42d St., New York City, for a water supply system for this city, to cost \$38,000. The enterprise includes a filtration system, tower pumping station at Loramie Creek, 10 miles of pipe, purification station and equipment. The voters recently authorized \$30,000 for a new pump, but the vote was declared illegal and it is expected that another election will be held about Oct. 20. Albert Schroeder, city building director of public service.

Youngstown, O.—The capital issues committee has approved the \$200,000 water works improvement bonds. They have already been sold.

Henryetta, Okla.—Waterworks, \$100,000, bond issue will be voted on by the citizens.

McAlester, Okla.—City at election, Oct. 3, defeated the proposition to issue

water bonds, \$400,000. J. M. Gannaway, clerk.

Pottsville, Pa.—The Girard Water Co. is contemplating the construction of a reservoir with a capacity of 250,000,000 gallons on Whiskey Mill Creek, west of Kingtown, in the Catawissa Valley. The company reservoir nearer Kingtown has a capacity of 500 million gallons. This is inadequate at times to supply the demand made upon it. The company supplies the Shenandoah and the Manonning valleys with a portion of the supply.

Wheeling, W. Va.—Chester & Fleming, engrs., Union Bank Bldg., Pittsburgh, Pa., prepared plans for filtration plant here, about \$500,000.

College Park, Ont.—At a cost approximately \$18,000, including \$25,000 for water system, \$8,000 for building, 40x100 ft., for dormitory and dining quarters for 500 students of army training corps, the Maryland State College considers improvements. A. F. Woods, president.

Moose Jaw, Sask.—In connection with contemplated extension of water supply system, city plans to lay c.-i. water pipe from Snowdy Springs water supply works to city's steel water supply pipes and build filters, etc.

BIDS RECEIVED AND CONTRACTS AWARDED.

(*Indicates Contracts Awarded.)

Castle Rock, Colo.—*D. F. Reid, for improving water works system to include installation of new cribs, city council.

Putnam, Conn.—*Warren Foundry & Machine Co., Phillipsburg, N. J., for furnishing 9,600 ft. 16-in. c.-i. water pipe at \$59.50 per ton. *Vita Construction Co., Thompson, for laying said pipe at \$1.80 per ft., involves 4,000 cu. yds. earth excavation. Bd. water comrs.

Washington, D. C.—*Hyde & Baxter, 116 Carroll Ave., Takoma Park, D. C. at \$17,917, for circulating system. U. S. Govt., C. W. Parks, chief bureau yards and docks, Navy Dept., Washington, D. C.

Carey, Ida.—*Atlas Development Co., Salt Lake City, Utah, for building multiple arch concrete dam, Eastwood type, 110 ft. high, at \$600,000. Work involves 6 or 7 miles earth canal, by Carey Valley Reservoir Co.

Topeka, Kan.—*Merkle Machinery Co., Kansas City, Kan., for installation of centrifugal pumps at city water works, at \$4,260.

Boston, Mass.—*O. M. Callahan, 29 Mt. Vernon St., Dorchester, Mass., at \$2,805, for laying and relaying water pipes in West Roxbury, Dept. of public works.

Akron, O.—*Rensselaer Valve Co., Ontario St., Troy, N. Y., at \$42,280, for furnishing one 36-in. and one 30-in. motor-driven gate valve and about 450 hand-operated gate valves, Contract No. 117, from 3-42 in. in size and shape, 10-in. automatic air valves. *Hardware & Supply Co., West Market St., at \$2,350, furnishing and erecting traveling crane bridge and trolley and 10-ton chain block, Contract No. 120. G. P. Hoffman, dir. public service.

Oklahoma, Okla.—City let contract for installation of water and sewer system and material and machinery for same: *Tibbets & Pleasant, Tulsa, Okla., general construction of power house, dam, intake, basins, reservoir, etc., \$135,200, and laying cast iron mains at \$37,659. *American Cast Iron Pipe Co., Birmingham, Ala., for furnishing cast iron pipe, at \$90,500. *Smedley Construction Co., Miami, Okla., for sewer mains, at \$6,756. *F. B. McCormack, Tulsa, Okla., for sewer treatment plant at \$69,000. *E. J. Merkle Machinery Co., Kansas City, Mo., for pumping machinery, steam power plant, engine and generator, erection of all machinery in power plant, at \$65,200. *Pittsburgh Filter Co., Pittsburgh, Pa., filtration system at \$46,200; and *Rensselaer Valve Co., Troy, N. Y., for valves and hydrants, at \$6,479.

Newport News, Va.—*Wise Granite & Construction Co., of Richmond, Va., water development here. U. S. Govt., F. M. Gimby, engr., 7th and B sts., S. W., Washington, D. C.

LIGHTING AND POWER

Crescent City, Fla.—Sealed bids received by A. F. Lounds, city clerk, Oct. 25, for the purchase of \$10,000 electric light bonds.

Belhaven, N. C.—City has sold the following bonds: Electric light, \$25,000; funding, \$10,000, to Sidney Spitzer & Co. of Toledo. W. W. Cuthrell, clerk.

Huron, O.—Water and light bonds to the amount \$4,500 has been purchased by Durfee, Niles & Co., of Toledo. T. H. Dyer, village clerk.

Madison, S. D.—An election is to be called to vote on the question of issuing \$150,000 electric light plant rebuilding bonds.

Tacoma, Wash.—D. E. Skinner, president of the Skinner & Eddy Corporation of Seattle, has been in this city consulting with H. F. Gronen, city light commissioner, relative to rates on power for a \$750,000 electric smelter which he is contemplating establishing in this city.

FIRE

Old Town, Me.—Plans are ready to figure for a fire alarm building for this city. W. H. Waterhouse mayor. Architect C. P. Crowell, Center St., Bangor, Me., one story, 20x14.

Cadiz, O.—A disastrous fire recently in the village of Flushing has resulted in a movement to install some kind of fire equipment. The loss is estimated at \$30,000. This city was unable to furnish aid, inasmuch as the village has no water system.

Lakewood, O.—The capital issues commission has approved the sale of \$60,000 bonds by the city of Lakewood for additional fire protection. This will enable the city to complete the fire house on Detroit Ave., corner of Kenilworth, and to equip it with suitable apparatus. It is also proposed to erect a third fire house, to be located on Madison Ave., opposite Grace. This will cover the new factory district that now includes several large plants engaged on war work.

New Philadelphia, O.—A recommendation that water lines be laid to Cottage and cross streets and that an additional 500 ft. of hose be placed on the fire truck has passed the council.

Youngstown, O.—The department of public safety will receive bids soon for the furnishing of one motor triple combination pump and hose cart with a capacity of not less than 750 gals, together with the necessary tools and equipment. Bidders shall consider bids on one old apparatus; same can be seen at No. 1 fire station, Boardman Ave. and Hazel St.

Johnstown, Pa.—Charles H. Stroup, superintendent of public property, is taking bids for alterations and repairs to one of the local fire engine house. Engineer R. Crissy, city hall.

BRIDGES

Cincinnati, O.—The county surveyor was authorized to proceed with the improvement of Bridge No. 10 on the Daily road and estimate the cost of improving Storm road from Howard road to Lee's Creek road.

Cincinnati, O.—See "Streets and Roads."

Hillsboro, O.—New bids will probably be taken this month for \$425,000 in improvements, including two bridges. The joint owners are Highland county, J. T. Ridgeway, auditor, and the state highway department at Columbus. Chas. F. Clark, court house, this city, engineer.

Beaver Falls, Pa.—The finance committee of the borough council will recommend to council that the Beaver county commissioners be urged to finish the improvements to the Tenth St. bridge as previously agreed upon with the New Brighton council.

BIDS RECEIVED AND CONTRACTS AWARDED.

(*Indicates Contracts Awarded.)

Kooskia, Ida.—*Lord Construction Co., Hamilton, Mont., building bridge over middle fork of Clearwater River, about \$25,000.

Fairmount, Minn.—*N. M. Stark & Co., Des Moines, Ia., at \$3,100, building

bridge No. 2968, in Ivy township, and No. 2967, in Tenhassan township, Martin county. Geo. A. Faber, associate engineer, Fairmont.

Warrenburg, Mo.—*Paul Hartung, 200 Bryant Bldg., Kansas City, Mo., building two bridges here, by Big Creek drainage district No. 2, Johnson county. T. Hyatt, clerk.

Philadelphia, Pa.—See "Streets and Roads."

MISCELLANEOUS

New Orleans, La.—A. G. Ricks, commissioner of public finances, will receive sealed bids until noon, November 7, for \$600,000 5 per cent. semi-annual public belt railroad bonds; proceeds will be used for extensions.

Boston, Mass.—Trustees of the Boston Elevator Railway Co. rejected bids for track work on Harvard St., Brookline, between Coolidge Corner and Aspinwall Ave., Oct. 3.

Biloxi, Miss.—City plans to issue \$30,000 worth of bonds for dredging a deep water channel into the city.

Libby, Mont.—C. G. Klenck, clerk of Lincoln county, will receive sealed bids until 2 p. m., Nov. 8, for \$48,000, not exceeding 6 per cent., semi-annual 10-20-yr. optional school bonds.

Buffalo, N. Y.—U. S. Engr. Office receiving bids Oct. 28 for dredging and rock excavation in Black Rock channel.

Glen Cove (L. I.), N. Y.—City council has approved the budget of expenses for the city for the year 1919. Some of the principal items on the budget are as follows: City council, \$3,904; mayor, \$1,720;

commissioner of finance, \$8,953; commissioner of public works, \$49,850, which includes the following items: Administration, \$5,563; garbage, \$8,600; sewers, \$1,768; sewer beds, \$4,000; sewer bonds, \$6,000; interest on sewer bonds, \$6,120; public buildings, \$6,074; streets, \$266; lighting, \$11,459. Commissioner of public safety as follows: Administration, \$5,850; health, \$2,793; police, \$16,257; fire, \$15,576.80; water, \$7,629; charity, \$17,030.

Bethaven, N. C.—See "Lighting and Power."

Canton, O.—See "Water Supply."

Martin Ferry, O.—The proposed issue of \$500,000 improvement bonds will be submitted to the capital issues committee before being voted on.

Ambridge, Pa.—See "Sewerage."

Philadelphia, Pa.—Bureau yards and docks, Navy Dept., Washington, D. C., receiving bids Oct. 21, building at League Island hospital, specification 3481, about \$2,500.

Waco, Tex.—City's garbage plant, located on the west bank of the river, at the foot of Jones St., was practically destroyed by fire Oct. 4.

Ogden, Utah—It has been decided to put off offering the proposed \$125,000 refunding bonds, approved by the capitol issues committee, until after Jan. 1.

Yorktown, Va.—Bureau Yards and Docks, Navy Dept., Washington, D. C., plans to build here wood and tile pier (spec. 3491), about \$123,000.

Camas, Wash.—City council adopted resolution to provide a sinking fund of \$2,000 a year with which to build a city hall. The cost is estimated to be \$10,000. The money will be put in Liberty Bonds until after the war.

Wheeling, W. Va.—U. S. Engr. Office, Wheeling, receiving bids Oct. 28 for furnishing and delivering structural steel for power houses for dams Nos. 21, 23, 25

and 27 in Ohio River.

Ashland, Wis.—The Hanchett Bond Co. of Chicago successful bidder for the 5 1/2% semi-annual 5-9-year (serial) improvement bonds, \$20,000. W. C. Morris, city clerk.

Bowness, Alta.—A hospital costing \$500,000 is contemplated by the department of public works, Edmonton.

Dorpland, Alta.—The construction of a drainage system considered by the Provincial government, Edmonton, cost \$175,000. Mr. Douglas, engineer.

Kerrisdale, B. C.—The erection of a community building is contemplated by the town council. Mr. Pearson, councilor.

Prince Rupert, B. C.—The city council contemplates the erection of a cold-storage plant. P. Lorenzen, engineer.

South Vancouver, B. C.—The sewerage board has planned improvements to drainage system. Mr. Whittaker, municipal engineer.

BIDS RECEIVED AND CONTRACTS AWARDED.

(*Indicates Contracts Awarded.)

Buda, Ill.—*S. Day, Rock Island, building drainage system, 78,478 cu. yds. open work. *Sheffield Tile Co., Sheffield, 6,760 ft. tile, Pond Creek Union district No. 1.

Albany, N. Y.—Telton Construction Co., 1450 Michigan Ave., Buffalo, at \$182,182; C. H. Everett, 295 Auburn Ave., Buffalo, \$199,302, low bidders Oct. 8, building terminal freight house on Pier No. 1, building, heating, and plumbing work, contracts Nos. 212, no bids received for heating, 212H and plumbing, 212P, barge

canal work. W. W. Wotherspoon, supt. **Port Burwell, Ont.**—*F. E. Tiffet, Erieau, Ont., general contract for repairs to pier for the Dominion government.

TOO LATE FOR CLASSIFICATION

BIDS ASKED FOR

STATE	CITY	RECD UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
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STREETS AND ROADS.

Ga., Macon 10 a.m., Nov. 4..Constructing concrete gutters on county road..... Bd. of Co. Comrs.
Ind., Fowler 1 p.m., Nov. 4..Constructing gravel road in Gilboa Twp..... Warren Mankey, Co. Aud.
Ind., Lawrenceburg.....noon, Nov. 6..Constructing macadam road in Lawrenceburg Twp..... Harry E. Lutherbeck, Co. Aud.
N. Y., Long Island City.....noon, Nov. 6..Paving terminal site..... W. W. Wotherspoon, Supt. of Pub. Wks., Capitol, Albany, N. Y.

N. Y., Troy noon, Nov. 6..Grading terminal site..... W. W. Wotherspoon, Supt. of Pub. Wks., Capitol, Albany, N. Y.

SEWERAGE.

O., Warren Oct. 23..Furnishing and laying 10 and 12-in. vitrified sewer pipe and appurtenances Dir. of Pub. Serv.

WATER SUPPLY.

Ont., Toronto noon, Oct. 21..Trenching and laying of water mains in several streets in York Twp..... Frank Barber, Twp. Engr., 40 Jarvis St., Toronto.
O., Akron Oct. 25..Laying about 3,400 lin. ft. 6-in., 5,300 lin. ft. 8-in. and 4,000 lin. ft. 10-in. cast iron pipe..... G. P. Hoffman, Dir. of Pub. Serv.

LIGHTING AND POWER.

Pa., Woodville noon, Oct. 21..Providing soot blowers for boilers for power house..... F. McC. Crooks, Archt., 950 Century Bldg., Pittsburgh.

FIRE EQUIPMENT.

O., Youngstown Oct. 21..Furnishing motor-driven triple combination pump and hose car with a capacity of not less than 750 gal., together with the necessary equipment..... Dir. of Pub. Safety.
N. J., Maplewood.....8 p.m., Nov. 6..Furnishing about 500 ft. rubber, single-jacket 2 1/2-in. hose Edward R. Arcularius, Twp. Clk.

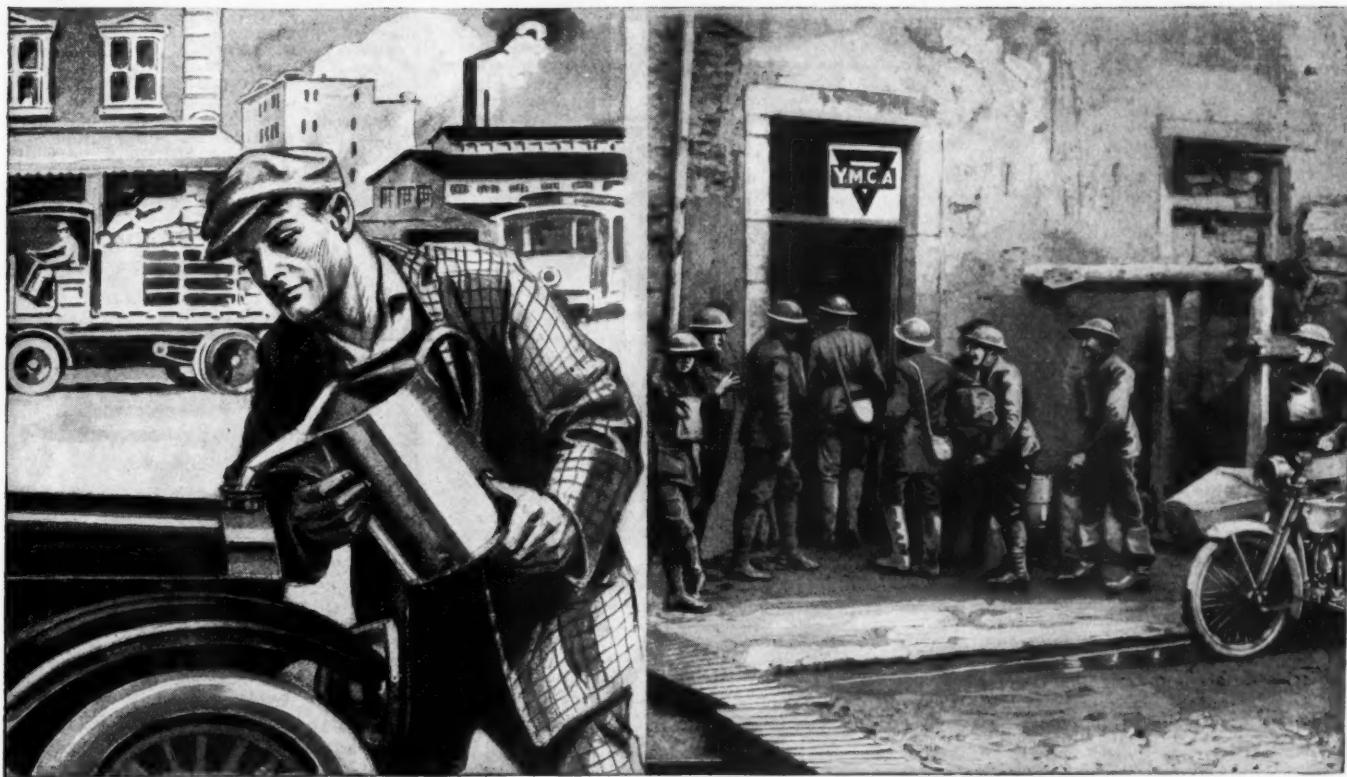
BRIDGES.

O., Columbus noon, Oct. 23..Constructing concrete retaining wall..... Geo. A. Borden, Dir. of Pub. Serv.
Ind., Marion 2 p.m., Oct. 30..Constructing steel or concrete bridge..... Mort McRae, Co. Aud.

MISCELLANEOUS.

Mass., Boston noon, *Oct. 21..Furnishing and installing four steel cages and iron chains for flith hoist, pumping station at Calf Pasture, Dorchester Thomas H. Sullivan, Comr. of Pub. Works, City Hall Annex.

Can., Ottawa noon, Oct. 22..Wire and cable for Parliament buildings..... P. Lyall & Sons Const. Co., Gen. Contrs.
O., Akron Nov. 1..Furnishing one 45-h.p. flusher; capacity of tank, 1,500 gal.; nozzles front and side discharge..... H. S. Morse, Dir. of Pub. Serv.



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You might think it something of a sacrifice to deliberately talk with one of your best truck drivers and tactfully urge him to go to France to drive for the Y.M.C.A.—and it would be a sacrifice. But it wouldn't be much compared to that of the army boys who have to depend on Y.M.C.A. truck drivers for what little they can get of home comforts—would it?

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It may be possible for me to get recruits for Y.M.C.A. truck service in France. Please send me full information regarding that service.

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Street and No.

Town and State.

STREETS AND ROADS.

Birmingham, Ala.—Paving on First Ave., between 44th and Wahouma Sts., will be completed by board of commissioners of Jefferson county; \$40,000.

Macon, Ga.—Bibb county board of commissioners receiving bids in November for constructing concrete gutters about six miles from Macon on each side of Camp Wheeler road; 1,500 ft. long, 4 ft. wide and 3 ft. deep. J. Ross Bowdre, clerk.

Council Bluffs, Ia.—City engineer has been instructed to pave approaches to N. 1st St. bridge.

Sioux City, Ia.—Because of the government order restricting building and improvements, the bid for paving 7th St., from Clark St. to Plymouth St., was rejected, and the contract for paving Orleans Ave., from South Pomegranate to South Cedar St., was canceled.

Salina, Kan.—Council received a petition for a sidewalk on the east side of Baker St., from Walnut St., running 200 ft. south.

Anoka, Minn.—Bids received for graveling East River road, from Minneapolis to Anoka; action deferred till spring, 1919; \$15,000.

Winona, Minn.—For federal aid project No. 8, state road No. 17; length, 6.42 mi.; clearing and grubbing, 4.9 acres; earth excavation, 39,842 cu. yds.; solid rock excavation, 7,141 cu. yds.; culvert, end walls, 180 cu. yds.; culverts, 12-in., 140 lin. ft.; 18-in., 622 lin. ft.; 24-in., 370 lin. ft.; 30-in., 65 lin. ft.; 36-in., 55 lin. ft.; 48-in., 65 lin. ft.; bridges No. 2949, 10-ft extension of cattle pass; No. 2865, 30-ft. span, reinforced concrete; No. 2866, 30-ft. span, reinforced concrete; W, 46x24 ft., reinforced concrete culvert, \$34,019; all bids rejected; new bids will be taken in spring. Adolph Baeurlen, county auditor.

Gulfport, Miss.—The Harrison county board of supervisors have contracted for six more miles of warrenite roads, the extension to be made from Pratt St. to the Gulfport Naval Training station on the east of the present paved roadway, and from Woodward Ave. to Long Beach on the west. The north and south road will be surfaced to Beat Four.

Milford, O.—Every effort is being made here to aid in speeding up the work on the repair of Main St., to be done by the state highway commission. The \$600 voted recently by the village council has been turned over to state authorities and the \$400 pledged by the Milford Automobile Club is also to be transmitted to Columbus soon. Citizens have subscribed \$800 and this will be turned over to the state authorities.

Gaffney, S. C.—Highway commission of Cherokee county has issued \$25,000 of road construction bonds. W. C. Harrick, chairman of board.

Spartanburg, S. C.—R. M. Grant & Co., New York, purchased \$202,000 of road bonds of Spartanburg county.

Salt Lake City, Utah—Indication that the federal government contemplates a sweeping curtailment of road construction projects now under way throughout Utah was contained in official communications received by Ira H. Browning, state road engineer, from F. D. Kneipp, district highway forester, directing that certain Utah projects be postponed until after the war. The principal project was the Heber-Fruitland stretch, extending a distance of fifty-two miles from Heber, in Wasatch county, to Fruitland, in Duchesne county. Survey of the St. George-to-Dameron valley section of the Modena-St. George federal road project will be carried out, but when finished no further work will be allowed. Surveying crews engaged on a section of the Cedar-Long Valley project in Iron and Kane counties were also called from work.

Salt Lake City, Utah—State road bonds aggregating \$100,000 have been purchased by the state land board for the benefit of the state school land trust fund.

Grand Rapids, Wis.—City considering paving with concrete 1 mi. in city of Grand Rapids and 1 mi. in city of Marshall. Louis Amundson, Grand Rapids, county highway commissioner.

Milwaukee, Wis.—Two resolutions were offered to the county board, Oct. 28, by Supervisor Melms, asking that \$100,000 be set aside for the construction of public buildings after the war, and \$280,000 for the construction of roads in 1919.

BIDS RECEIVED AND CONTRACTS AWARDED.

(*Indicates Contracts Awarded.)

Bloomington, Ind.—*William Murphy, by the county commissioners, to build the Hedrick Pike road or one and one-eighth miles in Bean Blossom township; \$4,297.20.

Wabash, Ind.—*J. C. O'Connor & Son, Fort Wayne, Ind., for \$21,385, by Wabash county, for the construction of the Twin Bridge extension road in Liberty township.

Albert Lea, Minn.—*J. R. Blanchard & Sons, Mankato, for grading Jefferson highway between Clarks Grove and Bancroft.

Billings, Mont.—*Jas. Phillips, Laurel, Mont., for grading Blue Creek hill, south of Billings.

Portland, Ore.—Warren Construction Co., only bidder for gravel bituminous pavement on E. 52d St., from the south line of lots 44 and 54, Melrose, to the south line E. Gilson St., at \$2.15 per sq. yd.; \$14,742.

Centralia, Wash.—*Ward & Jarvis, of this city, for building the Quinalt Lake road in Grays Harbor county; \$42,052.

Eau Claire, Wis.—*Andrew Larson & Co., for concrete paving on Galloway St.

Janesville, Wis.—*Chas. Wileman, Edgerton, for Janesville and White-water road, town of Luna; \$3,000.

Seattle, Wash.—*J. A. McEachern Co., at \$100,590.14, for building approaches to Eastlake Ave. bascule bridge. Board of public works.

Seattle, Wash.—*Puget Sound Bridge & Dredging Co., at \$19,127.10, for paving 26th Ave. S. W., et al. Board public works.

Ste. Therese, Que.—Arthur Blanshard, for macadamizing roadway for the town council.

SEWERAGE.

Highland Park, Mich.—Manufacturers and business men have petitioned the city to construct a sewer from Woodward to Hamilton Ave. to relieve the congestion in the Woodward sewer.

Delaware, O.—See "Water Supply."

Hamilton, O.—K. E. Krieger, clerk of the council, stated that the legislation for the construction of sewer in 11th, 12th and 13th Sts. has passed the council. A bond issue for this improvement will be authorized.

Lakewood, O.—Preliminary plans have been drawn for a sewer for Clifton Blvd. and Lake road, to cost \$150,000. It is not yet determined when bids will be invited. A. E. Fisher is engineer. B. M. Cook, mayor.

Warren, O.—Geo. T. Hecklinger, clerk of the council, states that the ordinance to proceed with the improvement of the sub-district No. 2 of the southwest sewer district of the city for constructing a sanitary trunk sewer has passed the council.

BIDS RECEIVED AND CONTRACTS AWARDED.

(*Indicates Contracts Awarded.)

Philadelphia, Pa.—See "Water Supply."

Washburn, Wis.—*Gray-Robinson Construction Co., Manitowoc, Wis., for 7 blocks, tile sewer. City council. L. M. Clausen, clerk.

Wauwatosa, Wis.—*W. F. Werner, 52d St., Milwaukee, Wis., for sanitary sewer. City council. J. W. Lowther, engineer.

Brampton, Ont.—*G. C. Reid, 23 Earls-court Ave., Toronto, for constructing a sewage disposal plant at \$11,056.

WATER SUPPLY.

Hagerstown, Md.—Enlarging the filtration plant of the city waterworks at the pumping station on the Antietam creek at Bridgeport is considered by the Hagerstown water board.

Malta, Mont.—City soon lets contract for pumping station. H. M. Kirton, city clerk.

Omaha, Neb.—Acting Secretary of War Crowell has approved the connection of Fort Crook with the Omaha water system. The order will be rushed through with the intention of starting work as soon as possible.

Newark, N. J.—The city was given the right to lay water pipes on the south side of the Lincoln highway near the Passaic river. Similar permission must be obtained from Hudson county, as this stretch of thoroughfare is under the control of both counties.

Delaware, O.—The service committee reported favorably on the request that the water main be extended on Channing St. to serve the new plant of the K. & W. Rubber Co. Also recommended the extension of the sanitary sewer on Channing St. to the new rubber plant. The proposition of the city furnishing 171 ft. of 24-in. sewer tile to be placed in a ditch in Channing St. was referred to the service committee and the city engineer with power to act.

Palestine, Tex.—Will vote on the purchase of the waterworks for \$130,000.

Meeteetse, Wyo.—This town voted Sept. 24, \$7,500 water improvement bonds. P. R. Lewis Zimmerman, clerk.

York, Ont.—In various streets council plans to build 6-in. c. i. water mains and all specials; about \$48,250. W. A. Clarke, Toronto, township clerk.

BIDS RECEIVED AND CONTRACTS AWARDED.

(*Indicates Contracts Awarded.)

Hingham, Mass.—*Chicago Bridge & Iron Co., Chicago, Ill., at \$18,600, for elevated steel tank at Hingham. U. S. Govt. C. W. Parks, chief bureau yards and docks, navy department, Washington, D. C.

Ecorse, Mich.—*Brooks & Sons, Jackson, Mich., at \$30,000, for water main extensions in Ecorse. Village council. R. A. Murdock, engineer, Free Press Bldg., Detroit, Mich.

Wyandotte, Mich.—*T. C. Brooks & Sons, of Jackson, for the laying of water mains in West Wyandotte. City commission.

Shakopee, Minn.—*Lars Ovorn, for waterworks extension on 5th St., in W. Shakopee, \$7,475. P. J. Schmartz, city recorder.

Akron, O.—*T. W. McShaffrey Co., 173 S. Toye St., for water line at waterworks. Dept. of public service. G. Dixon, engineer, 102 E. Mill St.

Philadelphia, Pa.—*Bruno Pizzimento, 424 W. Holly Ave., Putnam, N. J., water, sewer and drainage here, at \$26,600. U. S. Govt. C. W. Parks, chief bureau yards and docks, navy department, Washington, D. C.

Seattle, Wash.—Swensson & Co., Arcade Bldg., \$7,222.50; J. Erickson, \$7,275; the J. A. McEachern Co., \$9,337.50, bidders for the furnishing of the three 50,000-gal. water tanks and the construction of the necessary supporting towers in West Seattle. Board public works. Supt. of Water L. B. Youngs.

Seattle, Wash.—*L. B. Staewer, for laying water mains on 11th Ave. S. W., at \$25,644.50. Board of public works.

FIRE EQUIPMENT.

Wyandotte, Mich.—City commission decided to purchase a Dodge fire truck for use at the central station.

St. Paul, Minn.—Architect C. A. Housler, city hall, will revise plans for fire station No. 2, to cost \$30,000. Two stories and basement, 66 1/2 x 77 1/2. Harry McColl, commissioner of public safety.

Buffalo, N. Y.—Plans have been drawn for \$3,000 in alterations to one of the city fire engine houses. City architect, Howard Beck, Municipal Bldg.

Bridgeport, W. Va.—A new chemical engine will probably be purchased by the council.

BRIDGES.

Gaffney, S. C.—Bridge to cost \$25,000 will be constructed on Montgomery St. by the city and the Southern Railway. B. Herman, engineer, Charlotte, N. C.

BIDS RECEIVED AND CONTRACTS AWARDED.

(*Indicates Contracts Awarded.)

Winchester, Ind.—*Stace Caty, Winchester, for 4 bridge repairs. Randolph county commissioners. W. W. Batchelor, engineer, Court House.

Kingman, Kan.—*E. Z. Boroughs & Son, at \$22,699, for building 5 bridges and 7 culverts. Kingman county. C. C. Martin, engineer.



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	Price
1-6½x10 American DCDD, with boiler	\$1,000
1-7x10 Lidgerwood DCDD, with boiler	1,100
1-7x10 Lambert 3 drum, with boiler	1,600
1-8x12 Mundy DCDD, with boiler	1,200
1-9x10 Lidgerwood, 3 drum, 32" drums, without boiler	1,900
With boiler	2,300
1-5x8 DCDD Reversible O&S, with vertical engine, without boiler	350
With boiler	550
1-7x10 Lambert DCDD, with boiler	1,100

COMPRESSORS

	Price
1-12x12 Laidlaw-Dunn-Gordon, belt driven, capacity 300'	\$750
1-12x12x16 Ingersoll, straight line, steam driven, capacity about 300' at 80 to 100 lbs.	600
1-Sullivan, 2 stage air, simple steam, capacity 1800' at 80 to 100 lbs.	2,500
1-14x12 Bury Duplex, belt driven, capacity about 550' at 80 to 100 lbs., each	1,000
1-14x16x10x16 Sullivan, 2 stage air, simple steam, capacity 600' at 80 to 100 lbs.	1,500
1-14x9x10 Bury, 2 stage, belt driven, capacity 850'	1,500
1-Ingersoll-Rand Imperial Type XB2, 500'.	2,000

DRAGLINES

	Price
1-Monighan-Walker steam machine, with 50' boom, 1½ yd. bucket, almost new	\$7,000
1-Flory outfit engine 18x12 heavy dragline type boiler, firebox 150 lb. pressure; boom, 60'; steel bucket, 2 yd.; new, 1917	9,000
1-24 Bucyrus, with 85' boom

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GRESS OF AUGUST 24, 1912, OF
MUNICIPAL JOURNAL, PUBLISHED**

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**WEEKLY AT NEW YORK, N. Y., FOR
OCTOBER 1, 1918.**

State of New York, County of New York. Before me, a Notary Public in and for the State and county aforesaid, personally appeared James T. Morris, who, having been duly sworn according to law, deposes and says that he is the business manager of the Municipal Journal, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and, if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor and business managers are:

Publisher—Municipal Journal and Engineer, 243 West 39th Street, New York City.

Editor—A. Prescott Folwell, Montclair, N. J.

Managing Editor—A. Prescott Folwell, Montclair, N. J.

Business Manager—J. T. Morris, White Plains, N. Y.

2. That the owners are: (Give names and addresses of individual owners, or, if a corporation, give its name and the names and addresses of stockholders owning or holding 1 per cent or more of the total amount of stock.)

Municipal Journal and Engineer, 243 W. 39th Street, New York City.

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James T. Morris, White Plains, N. Y.

A. Prescott Folwell, Montclair, N. J.

3. That the known bondholders, mortgagees and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are:

Swetland Publishing Company, 239 West 39th Street, New York City.

4. That the two paragraphs next above, giving the names of the owners, stockholders and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company, but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association or corporation has any interest, direct or indirect, in the said stock, bonds or other securities than as so stated by him.

5. That the average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the six months preceding the date shown above is.....(This information is required from daily publications only.)

JAMES T. MORRIS,
Business Manager.

Sworn to and subscribed before me this 7th day of October, 1918.

[Seal] H. H. MINER,
Notary Public, New York Co., 176.
(My commission expires March 30, 1920.)

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TREASURY DEPARTMENT, Supervising Architect's Office, Washington, D. C., April 5, 1918.—Sealed proposals will be opened in this office at 3 P. M., May 17, 1918, for the extension, remodeling, etc., of the United States Post Office and Court House at Chattanooga, Tenn. Drawings and specifications may be obtained from the Custodian at Chattanooga, Tenn., or at this office, in the discretion of the Supervising Architect. JAS. A. WETMORE, Acting Supervising Architect.

Bids received until November 4, 1918.

Sealed Proposals

HAMILTON, OHIO

Sealed bids will be received by the Director of Public Service of the City of Hamilton, Ohio, at the office of the Director of Public Service of said City until 12:00 o'clock noon on the fourth day of November, 1918, for fur-

nishing of pipes, valves, labor, machinery, equipment and material and performing all work necessary for the complete installation of a suction pipe line and connecting same to six wells, which are yet to be installed, and to the pumps now in use and located in the booster station belonging to said City.

The location of said work is in or near the well field from which said City is now pumping water.

Said material and work to be furnished and done in accordance with plans and specifications now on file with the Director of Public Service of said City of Hamilton, Ohio, for the improvement of the waterworks system of said City. The bids will be opened in public at 12:00 o'clock noon of the fourth day of November, 1918, and publicly read, after which they will be considered and the award made as early as practicable to the lowest and best bidder. The Director of Public Service of the City of Hamilton, Ohio, reserves the right to reject any or all bids.

Each proposal shall be endorsed with the title of the work, the name of the bidder and the date of its presentation.

The price in each case must be stated in both words and figures, and the bids shall be made as set out in the general specifications.

Each bidder is required to deposit with bid an affidavit of non-collusion.

Each bidder is required to deposit with his bid a certified check for an amount of not less than \$2,000, made payable without reserve to the Director of Public Service of the City of Hamilton, Ohio.

In each case where the bid is rejected, this certified check will be returned.

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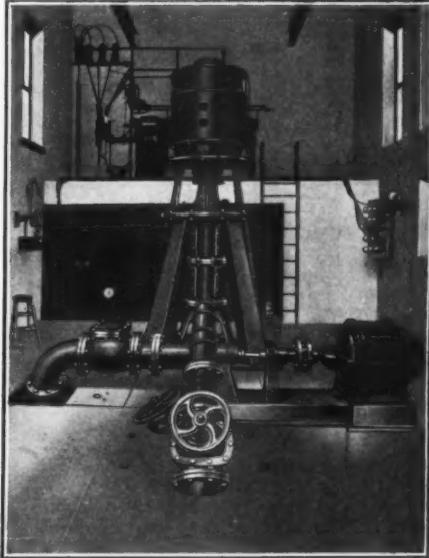
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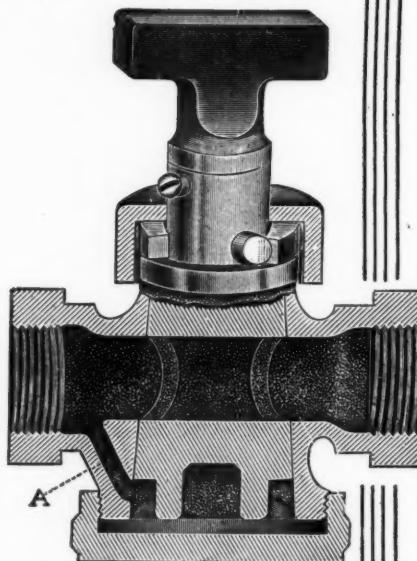


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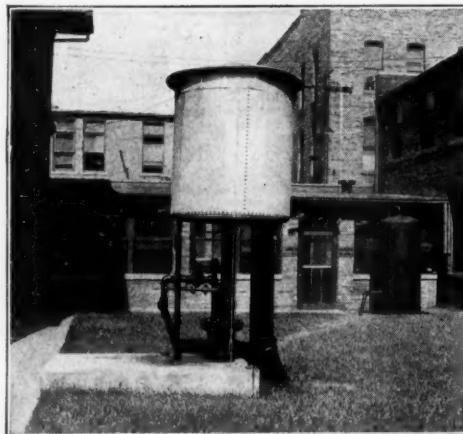
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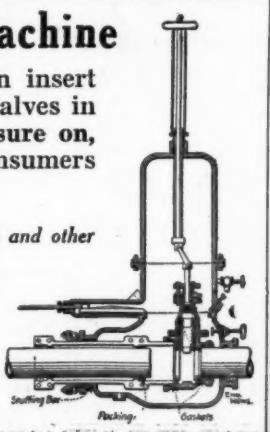
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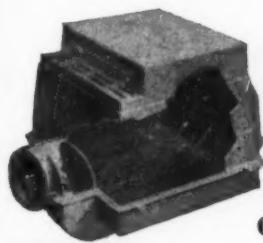


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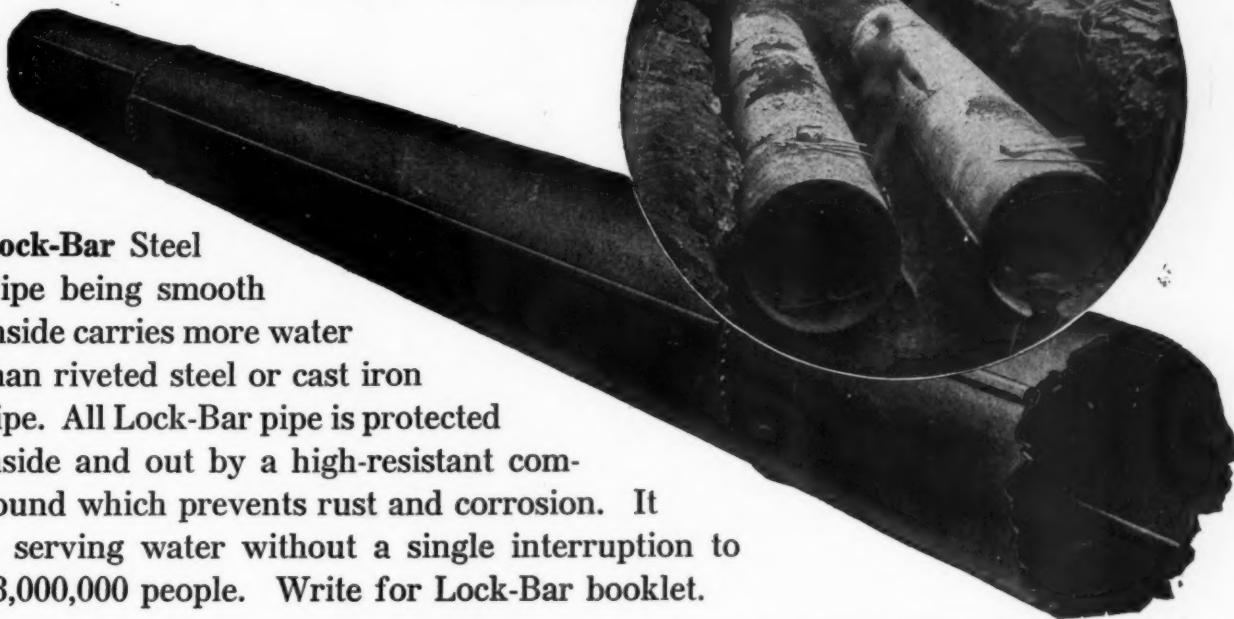
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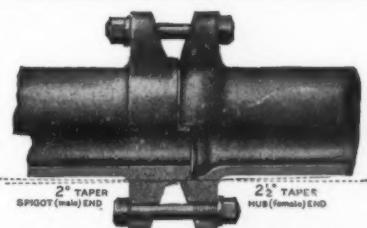
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